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**TRAFFIC IMPACT ANALYSIS**  
*for*  
**GOOGLE CAMPUS PHASE 2**

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Prepared for:  
***SRM Development***  
520 6<sup>th</sup> St S  
Kirkland, WA 98033

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## **I. Introduction**

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The following traffic study was prepared in accordance with the Traffic Impact Analysis Guidelines for proposed developments in the City of Kirkland. This study summarizes the project trip generation, concurrency results including project distribution and assignment, intersection impacts and level of service, site access issues, and mitigation recommendations.

According to the City's transportation guidelines, all commercial developments (non-residential) of more than 4,000 square feet with associated parking of 20 or more spaces are subject to environmental review under the State Environmental Policy Act (SEPA) and to road concurrency evaluation under the City's Concurrency Management Ordinance. The traffic impact analysis guidelines and subsequent analysis herein will assist in the determination of project compliance with transportation concurrency requirements, allow a thorough review of potential traffic impacts, and ensure that review and mitigation of all proposals occur in a consistent and equitable manner.

### **A. Existing Google Campus**

The existing Google Campus (aka Phase 1) is located on the west side of 6<sup>th</sup> St S; address 777 6<sup>th</sup> St S. The west side of the campus abuts to the abandoned railroad tracks/future community trail. The parcel numbers of the site are 7882600180 and 7882600175. The site consists of 3 buildings with a total gross floor area of 194,825 gsf. The campus is strictly for Google employees and includes two large restaurant/cafeterias, as well as some smaller scale recreation activity for employee breaks. The site has two driveway access points to 6<sup>th</sup> St S. Both are 30 feet wide with two lanes exiting and a single lane entrance. The south driveway is approximately 200 feet north from the 9<sup>th</sup> Ave S cross-street, and the north driveway is about 670 feet north of the south driveway. The north driveway is about 445 south from the 5<sup>th</sup> Ave S cross-street. As part of the Phase 1 campus development, 6<sup>th</sup> St S was rechannelized from a 2-lane roadway with on-street parking on both sides (no bike lanes) to a 3-lane roadway with a single lane each direction, a center two-way left turn lane, and bike lanes on both sides. The striping modification of 6<sup>th</sup> St S was made between 9<sup>th</sup> Ave S and the north end of the site. Tapers back to existing were also included at each end. Subsequently, the remainder of 6<sup>th</sup> St S between NE 68<sup>th</sup> St and Kirkland Way was modified by the City to include bike lanes on both sides, along with more defined on-street parking areas both sides.

The parking provided on the existing site is 631 stalls; 182 surface stalls and 449 garage stalls. A more refined breakdown of parking stall types is included in Section X, On-Site Parking.

## **B. Proposal**

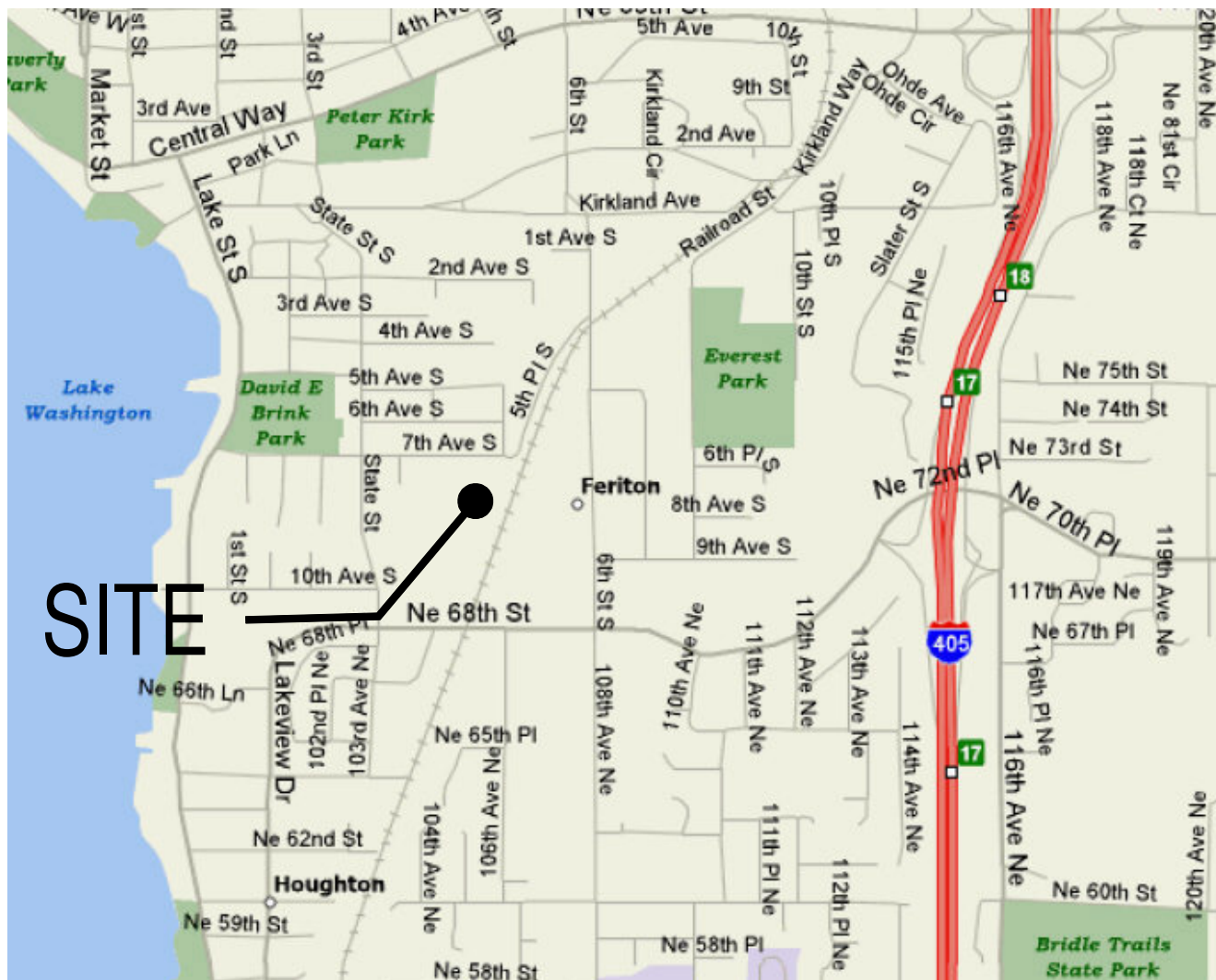
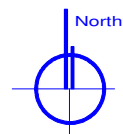
SRM Development LLC is proposing development of a new office building as part of the Google Office Park, Google Office Park Phase 2. The site is adjacent to the west side of the existing Google campus, separated by the abandoned railroad tracks/future community trail (Cross Kirkland Corridor), and south of 7<sup>th</sup> Ave S (the north end of the property fronts 7<sup>th</sup> Ave S). The parcel number is 7882600120. The site was formerly the Pace Chemical Company, which took access solely to 7<sup>th</sup> Ave S, but is currently vacant. The property has been vacant for more than one year thus there were no trip credits taken for traffic concurrency or the future year analysis. A vicinity map is presented in Figure 1.

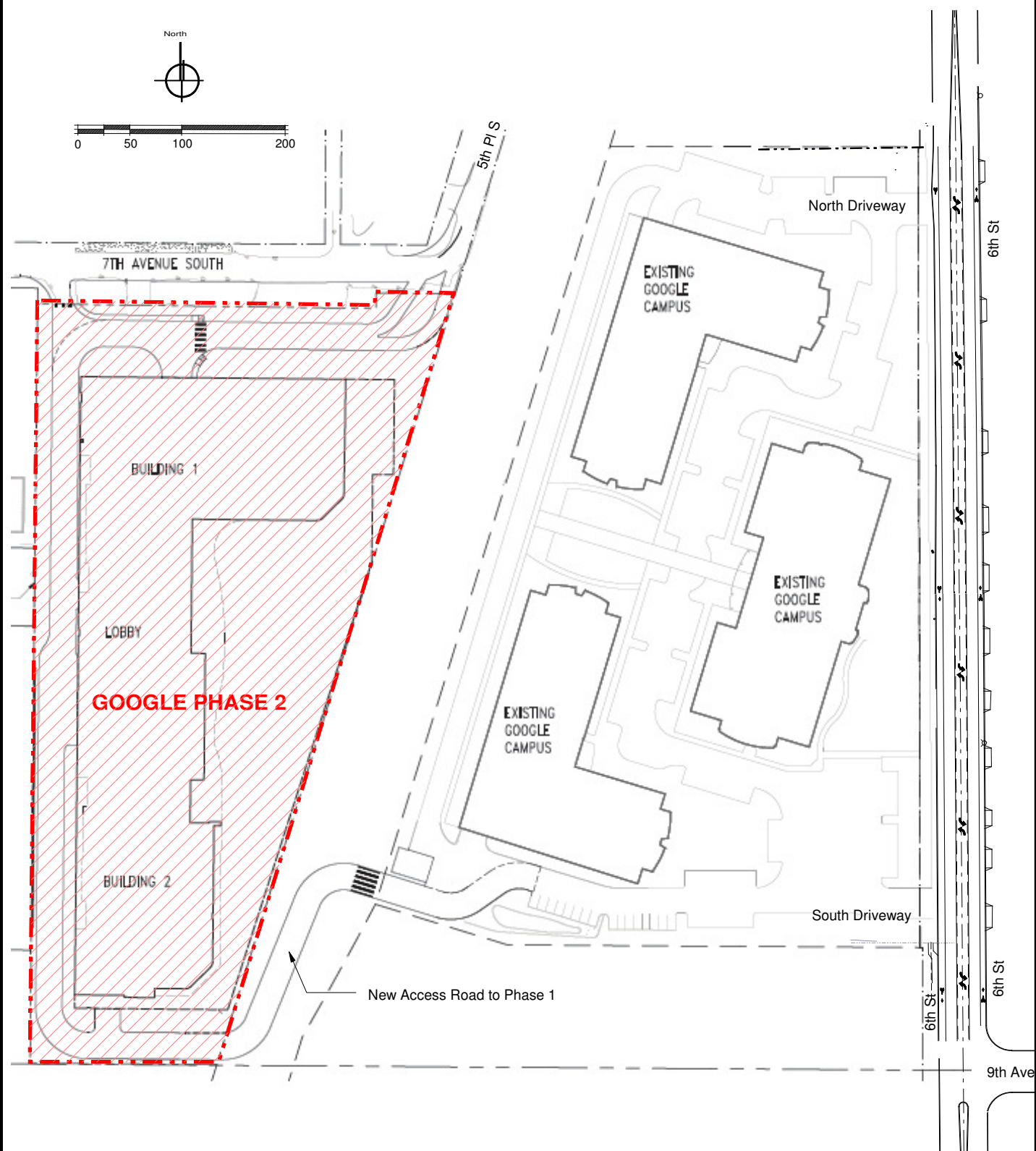
The proposal project will be for office use, for Google employees. The development is slated to consist of two connected buildings with an approximate gross floor area of 180,000 gsf of office use as well as other internal amenities including 1 or 2 restaurant/cafeterias and small recreational areas, identical to the Phase 1 campus.

The proposed parking supply will provide for 746 stalls. All of the stalls will be in the parking garage; there will be not surface parking. The parking garage will have two levels P1 and P2 with 371 stalls on P1 and 375 stalls on P2. There are two access points to P1, one at the south end and one at the north end. Vehicles can circulate the full P1 level and ingress/egress at either end. There are also two access points to P2. These two driveways are both on the west end of the site and the two driveways are located closer to the center of the garage. There are no ramps between P1 and P2.

From the garage, there are two proposed access points to/from the site, one at the northeast end of the site and one at the southeast end of the site. The north access will connect near the junction of 7<sup>th</sup> Ave S and 5<sup>th</sup> Pl S. The access will be designed such that no trips from the site can enter or exit to 7<sup>th</sup> Ave S (a local access neighborhood street). The south access will connect across the abandoned railroad tracks/future community trail to the existing Phase 1 campus' south end roadway parking lot circulation network with ultimate access to 6<sup>th</sup> St S at the existing Google south driveway. It is estimated that very few if any vehicles from the proposed project garage would use the existing campus north driveway for access to 6<sup>th</sup> St S.

A site plan is presented in Figure 2.





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## SITE PLAN

Google Office Park  
**PHASE 2**  
SRM Development LLC

Figure 2

## II. Existing Conditions

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The existing conditions section identifies the roadway and channelization features, traffic volumes, transit, and site access sight distance.

### A. Roadway Classification Definitions

The City of Kirkland has an adopted street functional classification system. The purpose of this system is to ensure that a system of roadways and streets provides a balanced relationship between mobility and land access. Mobility is the ability to efficiently travel along the roadway system, while land access is the ease of being able to connect to a particular development or parcel of land.

These classifications signify differing levels of accommodation for mobility and land access. The classification is hierarchical by the amount of travel mobility provided. Principal arterials primarily provide mobility, while local streets focus on providing land access. Table 1 summarizes the street functional classification system.

**Table 1**  
**Roadway Functional Classification Definitions**

<b>Functional Classification</b>	<b>Mobility</b>	<b>Access to Property</b>	<b>Traffic Volumes</b>	<b>Speed</b>
Highways(Freeway)	Highest	No Direct Access	Highest	40+ mph
Principal Arterials	High	Minimum	High	30 to 40 mph
Minor Arterials	Moderate	Moderate	Moderate	30 to 35 mph
Collectors	Low	Higher	Moderate to Low	25 to 30 mph
Local Streets	Very Low	Highest	Low	25 mph

The City's Roadway Functional Classification Map is shown in Figure 3 below.

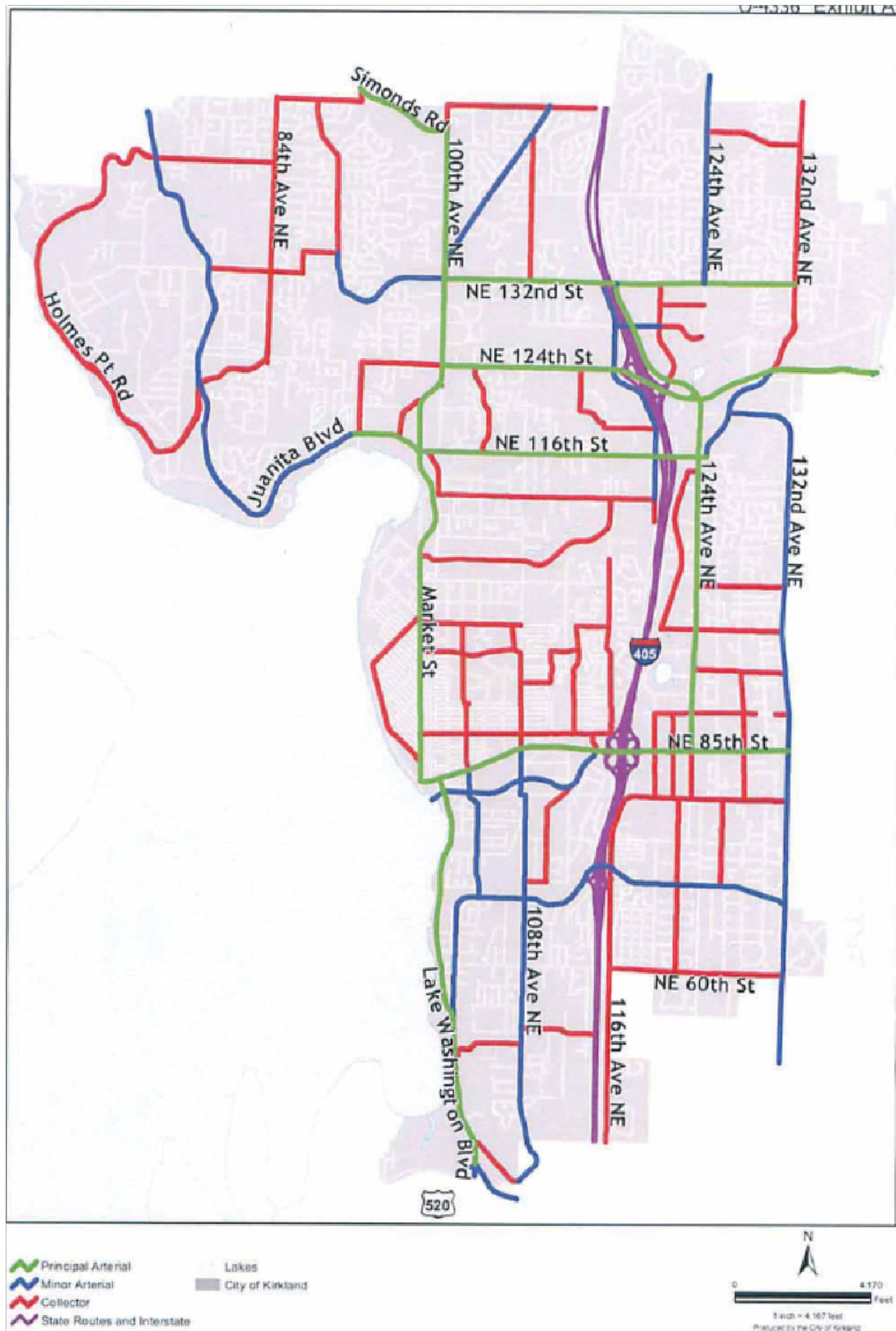


Figure 3

## **B. Roadway Inventory**

The primary existing road system utilized by project traffic would be 6<sup>th</sup> St, NE 68<sup>th</sup> St, and Kirkland Way. These streets are discussed below.

- 6<sup>th</sup> St (aka 108<sup>th</sup> Ave NE) is a two to three lane minor arterial with long-range connection between Central Way to the north and Northup Way to the south. Between NE 68<sup>th</sup> St and 9<sup>th</sup> Ave S, as well as between 5<sup>th</sup> Ave S and Kirkland Ave, the roadway includes a single lane each direction plus bike lanes and parallel on-street parking both sides, in addition to curb, gutter and sidewalks both sides. In the site vicinity, between 9<sup>th</sup> Ave S and the north end of the Google campus, the roadway includes a single lane each direction, a center two-way left-turn lane, bike lanes both directions, as well as curb, gutter and sidewalk both sides. No on-street parking is permitted in this section. North and south of this section, the center two way left turn lane ends and the roadway tapers back to the cross section noted above. There is a segment of 6<sup>th</sup> St S on the west side without sidewalk (700 ft +/-) between 5<sup>th</sup> Pl S and approximately 180 feet north of the Google campus north property line. Also, there is a segment of 6<sup>th</sup> St S on the east side without sidewalk just south of Kirkland Ave.

There are 11 driveways on the opposite side of the street along the site frontage. The posted speed limit is 30 mph south of Kirkland Ave.

- NE 68<sup>th</sup> St / NE 70<sup>th</sup> Pl is a three lane minor arterial connecting Houghton community with I-405 as well as connection to Lake Washington Boulevard. There are curb, gutters, and sidewalks on both sides as well as bike lanes. Marked pedestrian crosswalks are located at all of the signalized intersections along this roadway. The posted speed limit is 25 mph in the vicinity of 6<sup>th</sup> St.
- Kirkland Way is a two lane minor arterial connecting between the downtown waterfront and NE 85<sup>th</sup> St near I-405. There are partial curb, gutters, and sidewalks along the roadway as well as some on-street parking. The posted speed limit is 30 mph east of 6<sup>th</sup> St S and 25 mph west.
- 8<sup>th</sup> St S (and Railroad Ave) is a north-south two-lane collector roadway approximately 24-ft wide. This roadway connects between Kirkland Way and 9<sup>th</sup> Ave S with stop signs at both ends. The posted speed limit is 25 mph. There are four speed bumps (warning sign speed 15 mph) spread out along 8<sup>th</sup> St S. For the majority of the road, there is a centerline yellow strip and fog lane stripes on both sides. There is no curb, gutter or sidewalk.
- 9<sup>th</sup> Ave S is a east-west two-way 2-lane collector roadway running east from 6<sup>th</sup> St S past 8<sup>th</sup> St S to a dead-end area. The roadway is approximately 36 feet wide with on-street parking on both sides with curb, gutter and sidewalk (except on the north side

between 7<sup>th</sup> St S and 8<sup>th</sup> St S). There is no channelization markings on this roadway except for a double yellow center stripe through the 8<sup>th</sup> St S/9<sup>th</sup> Ave S intersection (eastbound to northbound, and southbound to westbound). The southbound and westbound approaches to the tee-intersection are stop controlled.

- 5<sup>th</sup> Pl S is a local access street serving commercial properties on the northwest side. It also connects to 7<sup>th</sup> Ave S, which serves residential land uses. The roadway has no channelization markings on it and it is of irregular width. At the south end the roadway is approximately 22 feet wide for a distance of 325 feet (+/-) with curb and gutter on the west side. North of this, the roadway is approximately 26- to 28-feet wide. In this section (800-ft +/-), there are varying sections with partial curb, gutter, and sidewalks. The posted speed limit is 25 mph. Due to the acute skew angle at 6<sup>th</sup> St S, commercial trucks are not permitted to turn right (eastbound to southbound).
- 5<sup>th</sup> Ave S and 7<sup>th</sup> St S are both local access streets with connection to 6<sup>th</sup> St S and the north end and 9<sup>th</sup> Ave S at the south end, both stop signs. There is intermittent small sections of curb gutter and sidewalks on both sides. Also some on-street parking permitted on 5<sup>th</sup> Ave S away from the 6<sup>th</sup> St S intersection. In general, the roadway is approximately 28 feet wide with no shoulders or channelization markings. There is signage at the west end of 5<sup>th</sup> Ave S denoting local access only.
- Kirkland Ave is a two-way 2-lane local access street with connection to Kirkland Way at both ends and intersects 6<sup>th</sup> St S. At the west end intersecting with Kirkland Way, the roadway has an abrupt radius to form a 90-degree intersection with Kirkland Way, approximately 24-feet wide with curb, gutter, and sidewalk on both sides. To the east of the intersection, is a steep grade eastbound and the roadway is approximately 28 feet wide with on-street parking on the north side as well as on the south side in certain locations. From 6<sup>th</sup> St S east to Kirkland Way, the roadway varies with a widened section 34-ft +/- to the west with gravel shoulders, to a center section 28-ft wide with on-street parking both sides as well as curb, gutter, landscape planter and sidewalk on both sides, then at the east end it narrows to a 20-ft section with no shoulders or other amenities. The posted speed or legal speed is 25 mph; there are no channelization markings on the roadway.
- 7<sup>th</sup> Ave S between State St and 5<sup>th</sup> Pl S is an east-west two-way 2-lane local access street. The roadway is generally 22- to 24-ft wide but widens at the west end at State St. There are curb, gutter and sidewalks at the west end near State St. There are two speed humps on this roadway with 15 mph signage. There is also 20 mph posted speed limit sign for school zone when children are present.

### C. Existing Traffic Volumes

Existing traffic volumes and historical trends on selected study area links are as follows:

- 6<sup>th</sup> St S north of NE 68<sup>th</sup> St: The 2011 Average Weekday Daily Traffic (AWDT) on this arterial north of NE 68<sup>th</sup> St is 10,860 vehicles per day (vpd) based on historical trends. The 2012 PM peak hour volume is approximately 970 vehicles; 400 southbound and 570 northbound. According to historical AWDT traffic count records from City data, the daily traffic volume on this roadway increased slightly up through 2000, remained relatively constant from 2000 through 2005, dipped from 2005 to 2009, likely due to recession, and then increased from 2009 to 2011 back to volumes similar to the 1997 counts. This AWDT volume change is shown in Figure 4 below. Note that the volume scale (y-axis) is magnified to show effect, with the lower limit value set at 8,000 vpd.

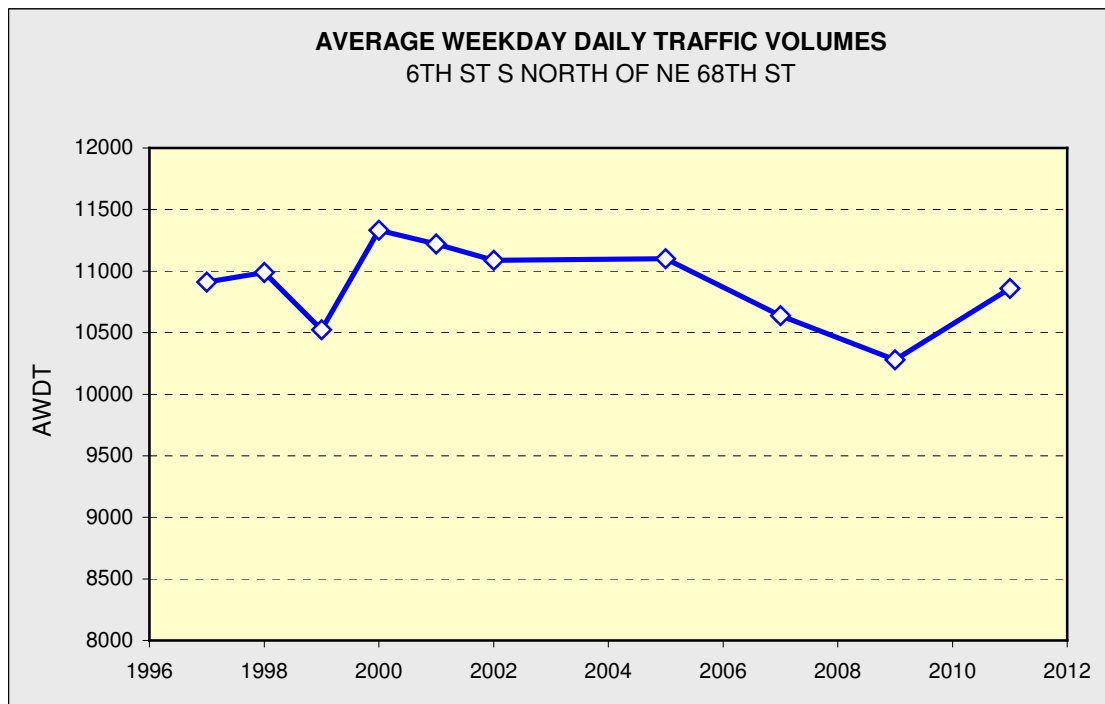


Figure 4

A two-day weekday count of 6<sup>th</sup> St S north of NE 68<sup>th</sup> St conducted in July of 2011 shows the volume by direction (northbound and southbound) as well as the total volume on an hourly basis. This volume chart is shown below in Figure 5. The data was provided by the City and reflects a two-day average (Tuesday and Wednesday).

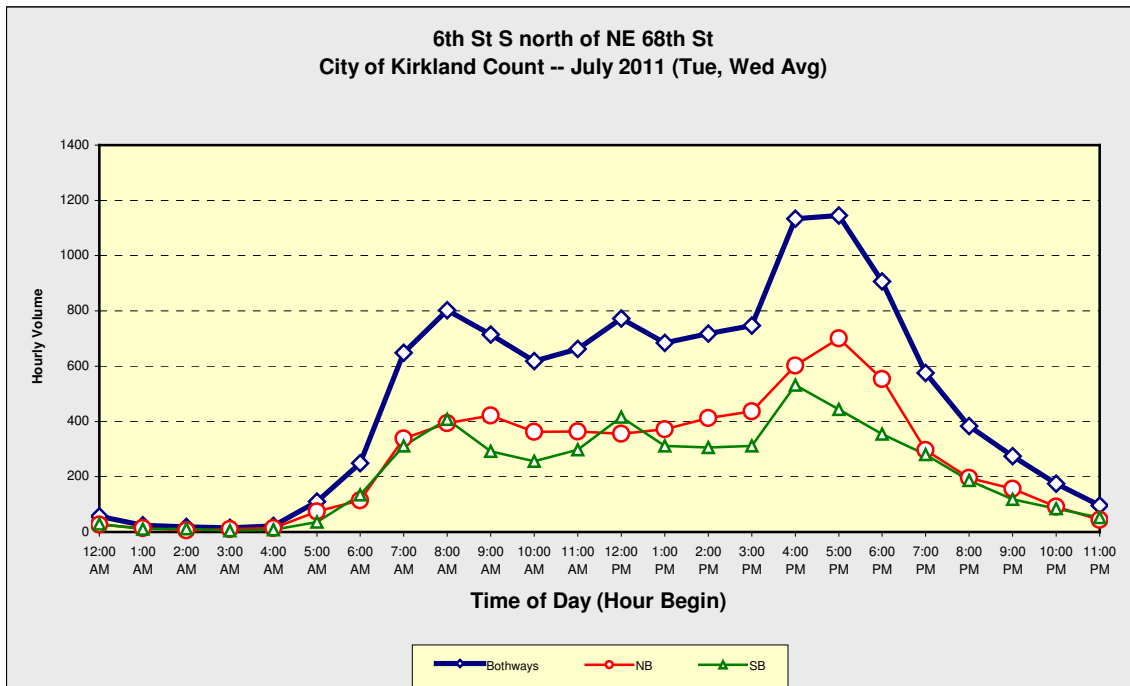


Figure 5

As shown in Figure 5, the time of day when the heaviest hourly volume occurs on 6<sup>th</sup> St S is the PM commute peak hour. The AM commute peak hour volume is noticeable lower.

- NE 68<sup>th</sup> St east of 6<sup>th</sup> St S: The 2011 Average Weekday Daily Traffic (AWDT) on this arterial is approximately 17,020 vehicles per day (vpd). The 2012 PM peak hour volume is approximately 1,170 vehicles; 585 westbound and 586 eastbound. According to historical AWDT traffic count records obtained from City data, and similar to patterns on 6<sup>th</sup> St S, the daily traffic volume on this roadway increased slightly from 1997 to 2000, remained relatively constant through 2005, dipped through 2009, and began to increase through 2011. This AWDT volume change is shown in Figure 6 below. The y-axis scale was magnified to show effect, with the lower limit value of 10,000 vpd (rather than 0).

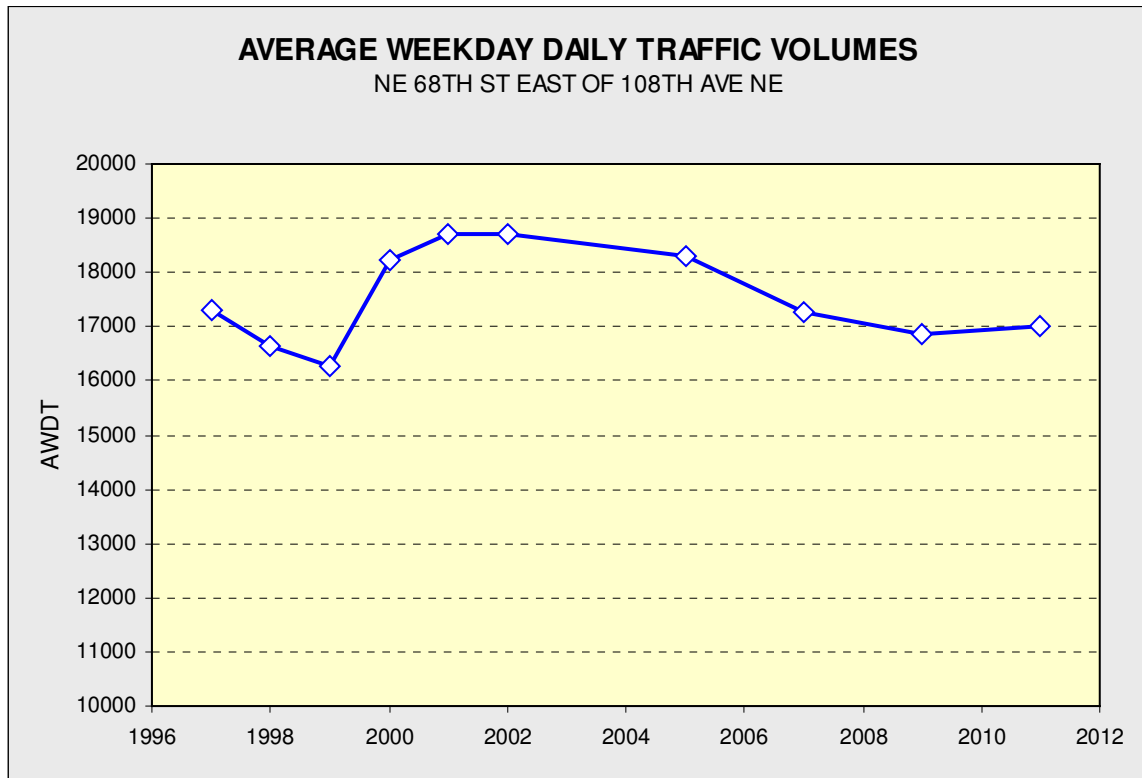


Figure 6

- Kirkland Way east of 6<sup>th</sup> St S: The 2011 Average Weekday Daily Traffic (AWDT) on this arterial is estimated to be approximately 7,140 vehicles per day (vpd). The 2012 PM peak hour volume is approximately 480 vehicles; 230 westbound and 250 eastbound. According to historical AWDT traffic count records obtained from the City, the daily traffic volume on this roadway remained relatively constant through 2009 and the has increased noticeably to 2011. This AWDT volume change is shown in Figure 7 below. The y-axis scale was magnified to show effect, with the lower limit value of 3,000 vpd (rather than 0).

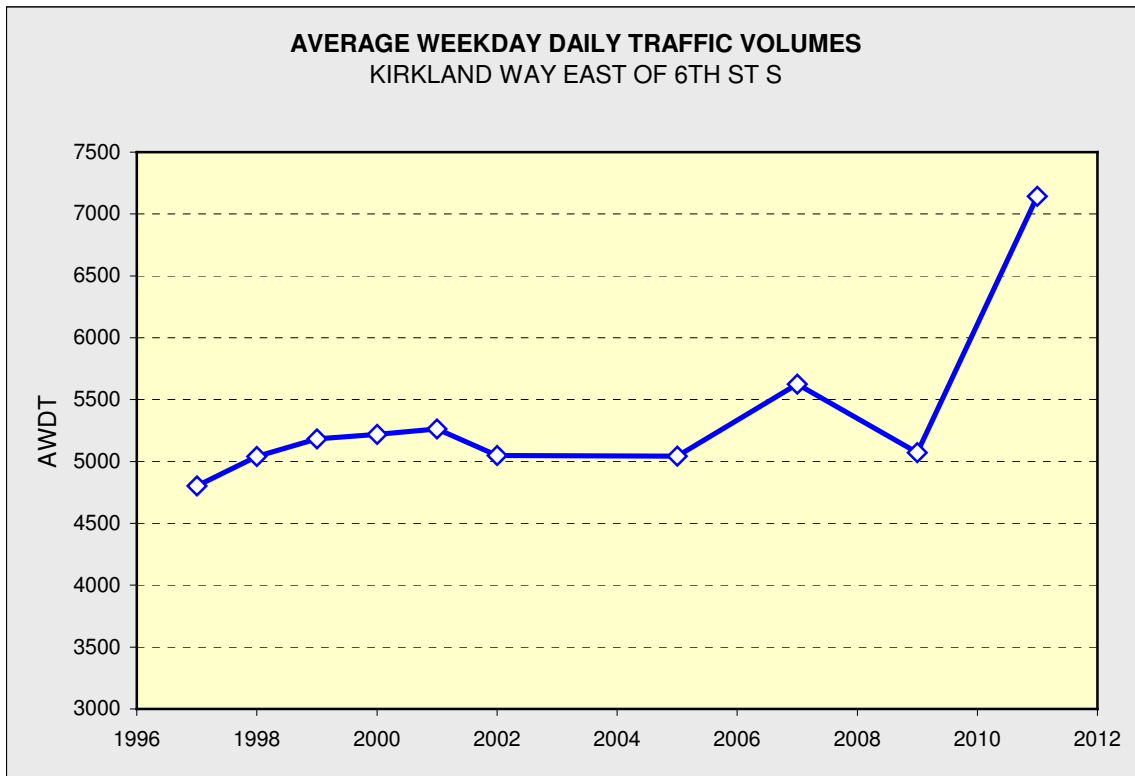


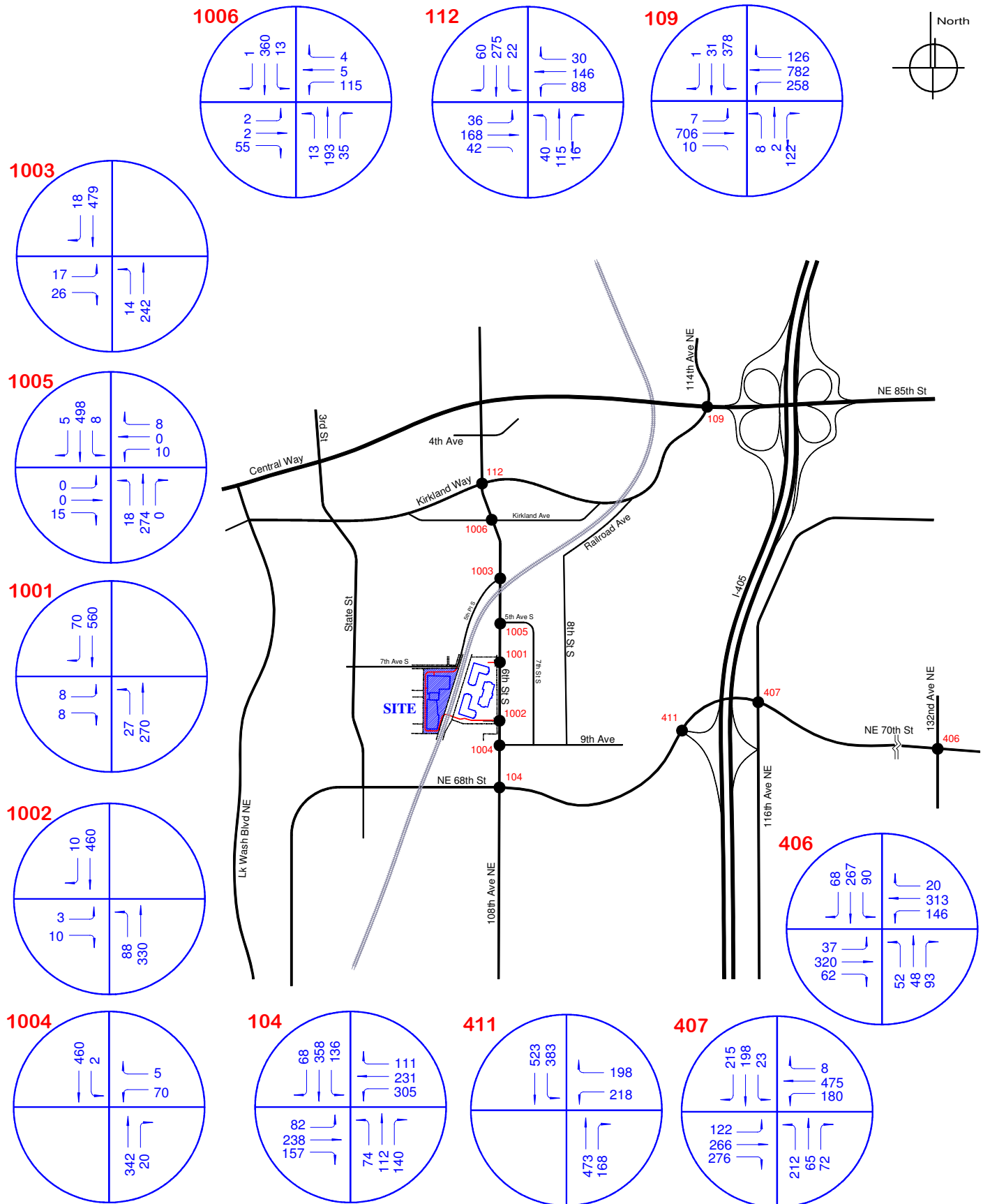
Figure 7

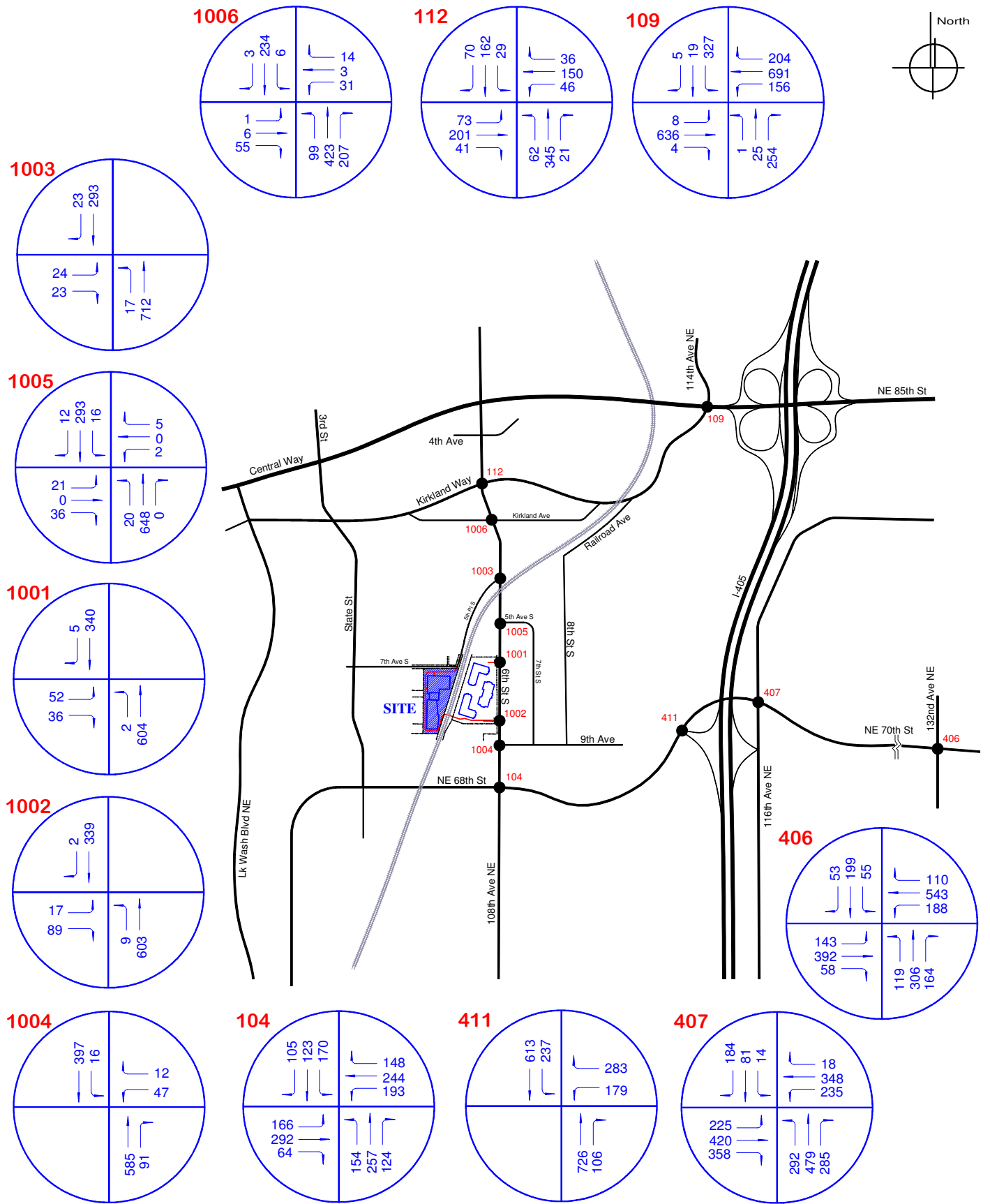
- 8<sup>th</sup> St S north of 9<sup>th</sup> Ave S: Data available from the City for neighborhood streets includes speed and volumes-per-day for the Everest Neighborhood for the period from 1999 through 2005; albeit slightly old. The 85<sup>th</sup> percentile speed was 32.9 in 1999 and dropped to 27.9 in 2001. It is assumed that the speed bumps were installed during this time. From 2001 through 2005 the speed data dropped to around 26 mph. The daily volume counts indicate volumes between 900 and 1000 vehicles per day.
- 9<sup>th</sup> Ave S. Recent AM and PM peak hour counts (Spring 2013) on 9<sup>th</sup> Ave S east of 6<sup>th</sup> St S show a volume of 102 vehicles (79 WB, 24 EB) in the AM peak, and 166 vehicles (59 WB, 107 EB) in the PM peak. Assuming a daily-to-PM-peak-hour factor of 10 (typical for residential) the estimated daily volume on 9<sup>th</sup> Ave S would be 1,660 vpd.
- 5<sup>th</sup> Ave S. Recent AM and PM peak hour counts (Spring 2013) on 5<sup>th</sup> Ave S east of 6<sup>th</sup> St S show a volume of 26 vehicles (18 WB, 8 EB) in the AM peak, and 23 vehicles (7 WB, 16 EB) in the PM peak. Assuming a daily-to-PM-peak-hour factor of 10 (typical for residential) the estimated daily volume on 5<sup>th</sup> Ave S would be 230 vpd. The driveway volume on the west side was 38 AM and 89 PM peak hour trips.

- 5<sup>th</sup> Pl S. AM and PM peak hour counts (Fall 2012) on 5<sup>th</sup> Ave S west of 6<sup>th</sup> St S show a volume of 75 vehicles (32 WB, 43 EB) in the AM peak, and 87 vehicles (40 WB, 47 EB) in the PM peak. The daily volume is estimated to be approximately 1,000 vpd.
- 7<sup>th</sup> Ave S. No counts were conducted on this roadway as part of this study. Older counts from the City (Sep 2003) indicate a daily volume of 450 vpd on this road (counted at 450 block, east of State St). It is assumed the volume on this roadway would remain constant.
- Kirkland Ave. AM and PM peak hour traffic counts were conducted Spring 2013. The AM volume was 78 west of 6<sup>th</sup> St S and 175 east of 6<sup>th</sup> St S. The eastbound right turn and westbound left turn comprised 97% of the approach volume. For the PM peak hour, the volume was 167 west of 6<sup>th</sup> St S and 268 east of 6<sup>th</sup> St S. The eastbound right turn comprised 88% of the approach volume and the westbound left turn comprised 64% of the approach volume. There is a heavy northbound right turn in the PM peak hour onto Kirkland Ave. The daily volume is estimated to be approximately 3,000 vpd.

The existing AM and PM peak hour turning movement volumes at selected intersection are shown in Figure 8a and 8b respectively. The City provided the traffic volumes at the outlying arterial-arterial intersections. TDG conducted all of the driveway counts as well as the count at the 6<sup>th</sup> St S/5<sup>th</sup> Pl S intersection in the Fall of 2012. William Popp Associates (WPA) conducted the traffic counts at 6<sup>th</sup> St S/9<sup>th</sup> Ave S, 6<sup>th</sup> St S/5<sup>th</sup> Ave S, and 6<sup>th</sup> St S/Kirkland Ave in the Spring of 2013.

All of the outlying intersections were selected for further study based on the City's proportional share worksheet calculations for determining project percentage impact thresholds, discussed later. The local area intersections (all those along 6<sup>th</sup> St S) including the two driveways were counted and analyzed for local area impact considerations as part of this TIA.





#### **D. Transit Service**

King County Metro as well as Sound Transit currently provide several bus routes along 6<sup>th</sup> St S, along the existing Google campus frontage. These routes include Metro Routes 245, 255 and Sound Transit Route 540. There are bus stops on both sides of the street in the vicinity of the site. There are three neighboring Transit Centers and/or Park and Ride lots. These would include the Kirkland Transit Center located in downtown Kirkland, the Bridle Trials Park & Ride, and the South Kirkland Park & Ride. These three routes are discussed below:

Route 245 – This route runs between the Kirkland Transit Center and the Eastgate Park & Ride passing through Overlake area of Bellevue/Redmond through the Overlake Transit Center. It runs both north and south on 6<sup>th</sup> St S.

Route 255 – This route between the Brickyard Park & Ride near Bothell (NE 160<sup>th</sup> St I/C with I-405), across SR 520 and into Downtown Seattle. It runs both north and south on 6<sup>th</sup> St S.

Route 540 – This route is a Sound Transit route that connects between the Kirkland Transit Center and the University of Washington area. It runs both north and south on 6<sup>th</sup> St S.

Figure 9 shows the bus route map for the area surrounding the project.

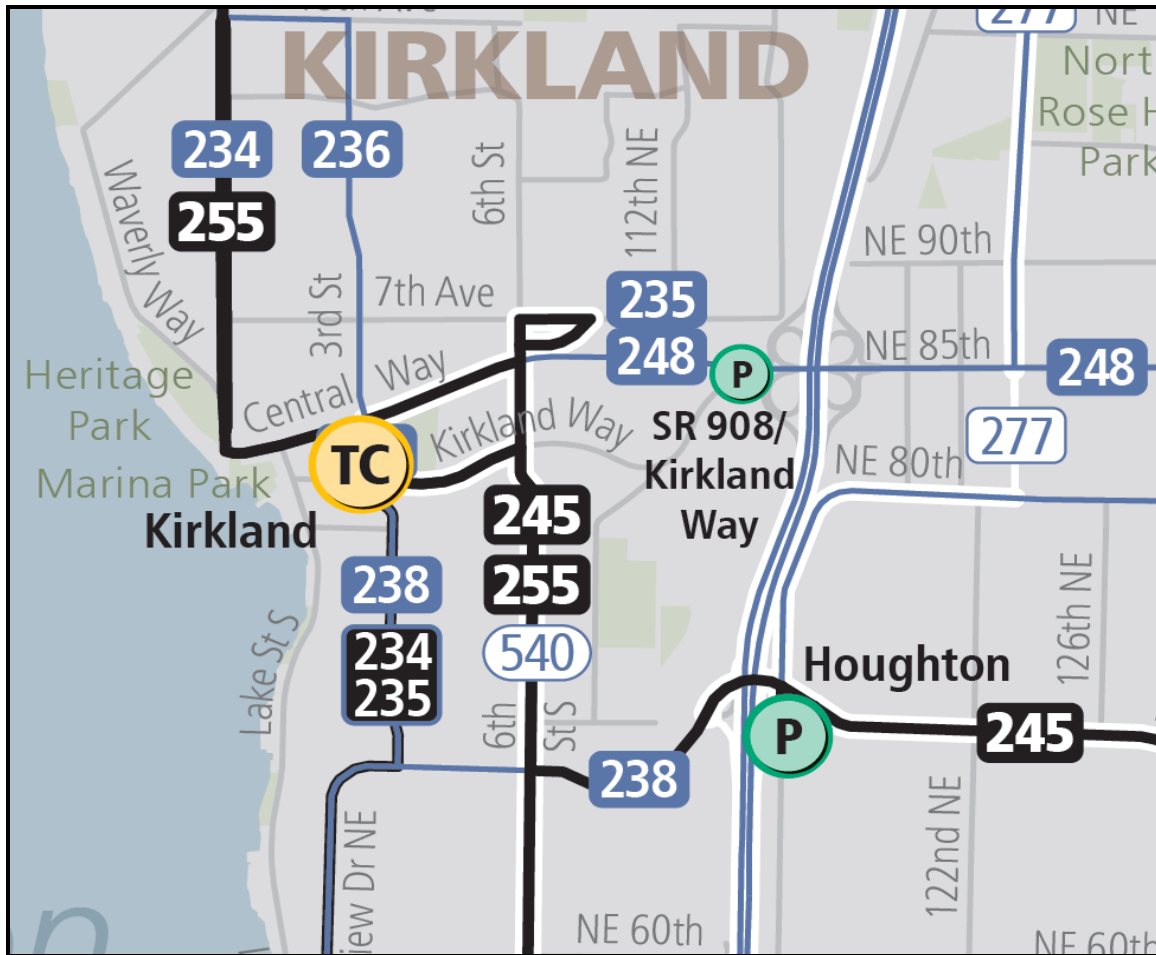


Figure 9

The nearest bus stop for these routes are at the south end of the existing campus on both sides of 6<sup>th</sup> St S.

A detail of bus stop times near the campus and the bus headways by direction for average weekday conditions are shown in Table 2a and 2b. Table 1a below identifies the bus times for the weekday AM period.

**Table 2a**  
**Estimated Bus Times on 6<sup>th</sup> St S near Google Campus – AM PERIOD**

ROUTE 245				ROUTE 255				ROUTE 540			
Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy
-	-	-	-	-	-	5:01 AM	-	-	-	-	-
-	-	-	-	-	-	5:31 AM	0:30	-	-	-	-
-	-	-	-	-	-	5:51 AM	0:20	-	-	-	-
-	-	-	-	-	-	6:09 AM	0:18	-	-	6:15 AM	-
-	-	-	-	5:54 AM	-	6:25 AM	0:16	-	-	6:43 AM	0:28
-	-	-	-	6:18 AM	0:24	6:36 AM	0:11	-	-	6:58 AM	0:15
-	-	-	-	6:33 AM	0:15	6:47 AM	0:11	-	-	7:15 AM	0:16
-	-	-	-	6:47 AM	0:14	6:59 AM	0:12	-	-	7:30 AM	0:15
-	-	-	-	6:57 AM	0:10	7:09 AM	0:10	-	-	7:45 AM	0:15
-	-	5:52 AM	-	7:07 AM	0:10	7:19 AM	0:10	7:07 AM	-	8:00 AM	0:15
-	-	6:16 AM	0:24	7:17 AM	0:10	7:30 AM	0:11	7:36 AM	0:29	8:15 AM	0:15
-	-	6:31 AM	0:15	7:29 AM	0:12	7:38 AM	0:08	7:53 AM	0:16	8:30 AM	0:15
6:26 AM	-	6:46 AM	0:15	7:41 AM	0:12	7:47 AM	0:08	8:11 AM	0:18	8:45 AM	0:15
7:02 AM	0:36	7:01 AM	0:15	7:49 AM	0:08	7:55 AM	0:08	8:26 AM	0:15	9:00 AM	0:15
7:19 AM	0:17	7:16 AM	0:15	7:59 AM	0:10	8:03 AM	0:08	8:57 AM	0:31	9:15 AM	0:15
7:37 AM	0:17	7:31 AM	0:15	8:09 AM	0:10	8:11 AM	0:08	-	-	9:45 AM	0:30
7:53 AM	0:16	7:46 AM	0:15	8:19 AM	0:10	8:19 AM	0:08	-	-	-	-
8:08 AM	0:15	8:01 AM	0:15	8:29 AM	0:10	8:27 AM	0:08	-	-	-	-
8:23 AM	0:15	8:16 AM	0:15	8:39 AM	0:10	8:37 AM	0:10	-	-	-	-
8:38 AM	0:15	8:31 AM	0:15	8:49 AM	0:10	8:46 AM	0:09	-	-	-	-
8:53 AM	0:15	8:46 AM	0:15	9:00 AM	0:11	8:56 AM	0:10	-	-	-	-
9:08 AM	0:15	9:01 AM	0:15	9:11 AM	0:11	9:05 AM	0:09	-	-	-	-
9:23 AM	0:15	9:16 AM	0:15	9:24 AM	0:12	9:20 AM	0:14	-	-	-	-
9:38 AM	0:15	9:31 AM	0:15	9:39 AM	0:15	9:36 AM	0:16	-	-	-	-
9:53 AM	0:15	9:46 AM	0:15	9:54 AM	0:15	9:52 AM	0:16	-	-	-	-
10:08 AM	0:15	10:01 AM	0:15	10:09 AM	0:15	10:08 AM	0:16	-	-	-	-
10:21 AM	0:13	10:16 AM	0:15	10:24 AM	0:15	10:24 AM	0:16	-	-	-	-
10:36 AM	0:15	10:31 AM	0:15	10:39 AM	0:15	10:40 AM	0:16	-	-	-	-
10:51 AM	0:15	10:46 AM	0:15	10:54 AM	0:15	10:55 AM	0:15	-	-	-	-
11:06 AM	0:15	11:01 AM	0:15	11:09 AM	0:15	11:11 AM	0:16	-	-	-	-
11:21 AM	0:15	11:16 AM	0:15	11:24 AM	0:15	11:27 AM	0:16	-	-	-	-
11:36 AM	0:15	11:31 AM	0:15	11:39 AM	0:15	11:43 AM	0:16	-	-	-	-
11:51 AM	0:15	11:46 AM	0:15	11:54 AM	0:15	11:59 AM	0:16	-	-	-	-
21		24		29		33		6		13	

\* Hdwy = Bus headway time; time between buses.

As shown in this table, bus times begin in the 5am to 6am time and generally run on 15 headways throughout the AM period. There are 56 buses traveling north and 70 buses traveling south during this approximate 7-hour period. Route 255 has a slightly closer headway during AM peak commute times, with 8-minute headways.

Table 2b below identifies the bus times for the weekday PM period.

**Table 2b**  
**Estimated Bus Times on 6th St S near Google Campus – PM PERIOD**

ROUTE 245				ROUTE 255				ROUTE 540			
Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy	Stop	Hdwy
12:06 PM	0:15	12:01 PM	0:15	12:10 PM	0:16	12:14 PM	0:15	-	-	-	-
12:21 PM	0:15	12:16 PM	0:15	12:26 PM	0:16	12:29 PM	0:15	-	-	-	-
12:36 PM	0:15	12:31 PM	0:15	12:41 PM	0:15	12:44 PM	0:15	-	-	-	-
12:51 PM	0:15	12:46 PM	0:15	12:56 PM	0:15	12:59 PM	0:15	-	-	-	-
1:06 PM	0:15	1:01 PM	0:15	1:10 PM	0:14	1:14 PM	0:15	-	-	-	-
1:21 PM	0:15	1:16 PM	0:15	1:24 PM	0:14	1:29 PM	0:15	-	-	-	-
1:36 PM	0:15	1:31 PM	0:15	1:39 PM	0:15	1:44 PM	0:15	-	-	-	-
1:51 PM	0:15	1:46 PM	0:15	1:54 PM	0:15	1:59 PM	0:15	-	-	-	-
2:06 PM	0:15	2:01 PM	0:15	2:09 PM	0:15	2:14 PM	0:15	-	-	-	-
2:22 PM	0:16	2:16 PM	0:15	2:24 PM	0:15	2:29 PM	0:15	-	-	-	-
2:39 PM	0:17	2:31 PM	0:15	2:39 PM	0:15	2:44 PM	0:15	-	-	-	-
2:56 PM	0:17	2:46 PM	0:15	2:54 PM	0:15	2:59 PM	0:15	-	-	-	-
3:13 PM	0:17	3:01 PM	0:15	3:11 PM	0:17	3:14 PM	0:15	3:00 PM	-	3:10 PM	-
3:28 PM	0:15	3:16 PM	0:15	3:24 PM	0:13	3:29 PM	0:15	3:20 PM	0:20	3:30 PM	0:20
3:43 PM	0:15	3:31 PM	0:15	3:37 PM	0:12	3:44 PM	0:15	3:43 PM	0:23	3:53 PM	0:23
3:58 PM	0:15	3:46 PM	0:15	3:48 PM	0:11	3:59 PM	0:15	3:59 PM	0:16	4:09 PM	0:16
4:13 PM	0:15	4:01 PM	0:15	3:58 PM	0:10	4:09 PM	0:10	4:14 PM	0:15	4:24 PM	0:15
4:30 PM	0:17	4:16 PM	0:15	4:08 PM	0:10	4:19 PM	0:10	4:29 PM	0:15	4:40 PM	0:16
4:47 PM	0:17	4:31 PM	0:15	4:18 PM	0:10	4:29 PM	0:10	4:45 PM	0:16	5:14 PM	0:34
5:07 PM	0:20	4:46 PM	0:15	4:29 PM	0:10	4:39 PM	0:10	5:01 PM	0:16	5:47 PM	0:33
5:23 PM	0:16	5:02 PM	0:15	4:39 PM	0:10	4:49 PM	0:10	5:16 PM	0:15	-	-
5:39 PM	0:16	5:17 PM	0:15	4:49 PM	0:10	4:59 PM	0:10	5:33 PM	0:17	-	-
5:55 PM	0:16	5:32 PM	0:15	4:59 PM	0:10	5:09 PM	0:10	5:48 PM	0:15	-	-
6:11 PM	0:16	5:47 PM	0:15	5:09 PM	0:10	5:19 PM	0:10	6:00 PM	0:12	-	-
6:24 PM	0:13	6:02 PM	0:15	5:17 PM	0:08	5:29 PM	0:10	6:13 PM	0:13	-	-
6:37 PM	0:13	6:16 PM	0:14	5:26 PM	0:09	5:39 PM	0:10	6:43 PM	0:30	-	-
6:50 PM	0:13	6:31 PM	0:15	5:37 PM	0:11	5:49 PM	0:10	7:10 PM	0:27	-	-
7:04 PM	0:14	6:46 PM	0:15	5:43 PM	0:06	5:59 PM	0:10	-	-	-	-
7:17 PM	0:13	7:01 PM	0:15	5:50 PM	0:07	6:10 PM	0:11	-	-	-	-
7:31 PM	0:14	7:25 PM	0:24	6:00 PM	0:10	6:20 PM	0:10	-	-	-	-
7:44 PM	0:13	7:55 PM	0:30	6:09 PM	0:09	6:32 PM	0:12	-	-	-	-
7:59 PM	0:14	8:30 PM	0:35	6:19 PM	0:10	6:44 PM	0:12	-	-	-	-
8:11 PM	0:12	9:00 PM	0:30	6:29 PM	0:10	7:05 PM	0:20	-	-	-	-
8:38 PM	0:27	9:35 PM	0:35	6:38 PM	0:08	7:26 PM	0:21	-	-	-	-
9:16 PM	0:38	10:05 PM	0:30	6:49 PM	0:11	7:56 PM	0:30	-	-	-	-
9:46 PM	0:30	11:05 PM	1:00	6:58 PM	0:09	8:26 PM	0:30	-	-	-	-
10:47 PM	1:01	12:05 AM	1:00	7:07 PM	0:09	8:56 PM	0:30	-	-	-	-
11:41 PM	0:54	-	-	7:17 PM	0:10	9:26 PM	0:30	-	-	-	-
-	-	-	-	7:27 PM	0:10	9:59 PM	0:33	-	-	-	-
-	-	-	-	7:40 PM	0:13	10:29 PM	0:30	-	-	-	-
-	-	-	-	8:07 PM	0:27	10:59 PM	0:30	-	-	-	-
-	-	-	-	8:37 PM	0:30	-	-	-	-	-	-
-	-	-	-	9:07 PM	0:30	-	-	-	-	-	-
-	-	-	-	9:36 PM	0:29	-	-	-	-	-	-
-	-	-	-	10:06 PM	0:30	-	-	-	-	-	-
-	-	-	-	10:36 PM	0:29	-	-	-	-	-	-
-	-	-	-	11:36 PM	1:00	-	-	-	-	-	-
38		37		47		41		15		8	

\* Hdwy = Bus headway time; time between buses.

As shown in this table, similar to the AM period, in general, each bus runs on 15 minute headways for the better part of the PM period. Route 255 runs on 10-minute headways during PM peak commute times.

There are 100 buses traveling north and 86 buses traveling south during this approximate 12-hour period.

Over the course of an average weekday 24-hour period, there would be 156 buses traveling both north and south on 6<sup>th</sup> St S between NE 68<sup>th</sup> St and Kirkland Way. This is a significant amount of bus traffic and opportunity for use for all types of uses of this stretch of roadway.

## **E. Accidents**

The 3 year accident history 2009 through 2011 for all intersections in the City provided by WSDOT Olympia Headquarters and then summarized for all of the study area intersections by WPA. The study area intersections noted in this table were determined based on the City's Concurrency analysis and the Significant Intersection impact analysis as well as the local area intersections. The concurrency process is discussed later in this report. The "target threshold" not-to-exceed intersection accident rate set by the city is typically 1.0 accidents per million entering vehicles (acc/mev).

The accident rates for the years 2009 and 2011 were computed based on estimates of total daily volume entering the intersection. Intersection (total entering) daily volumes were estimated based on selected link volume ADT from City counts compared with PM peak hour intersection counts in order to develop K factors (daily to PM) to apply to the PM peak hour total entering volume to estimate total daily volume entering intersection. The PM peak hour intersection volumes are 2012, thus the ADT entering volume each year back was adjusted down by 1%.

The number of accidents, the volume basis, and the subsequent annual accident rates are shown in Table 3.

**Table 3**  
**Intersection Accident History <sup>a</sup>**

Intersection	2011			2010			2009		
	# of Acc <sup>b</sup>	Entering Volume <sup>c</sup>	Acc Rate <sup>d</sup>	# of Acc <sup>b</sup>	Entering Volume <sup>c</sup>	Acc Rate <sup>d</sup>	# of Acc <sup>b</sup>	Entering Volume <sup>c</sup>	Acc Rate <sup>d</sup>
<b>Signalized and All-Way Stop Control Intersections</b>									
108th Ave NE/NE 68th St (104)	4	22440	0.49	4	22220	0.49	1	22000	0.12
NE 85th St/114th Ave NE (109)	12	25630	1.28	4	25370	0.43	12	25120	1.31
Kirkland Way/6th St S (112)	2	15300	0.36	2	15150	0.36	1	15000	0.18
NE 70th St/132nd Ave NE (406)	1	23070	0.12	3	22840	0.36	5	22610	0.61
NE 70th Pl/116th Ave NE (407)	12	29070	1.13	7	28780	0.67	7	28490	0.67
NE 70th Pl/I4-5 SB Ramps (411)	0	21230	0.00	1	21020	0.13	0	20810	0.00
<b>Side Street Stop Intersections</b>									
6th St S/5th Pl S (1003)	0	10920	0.00	0	10810	0.00	0	10700	0.00
6th St S/9th Ave S (1004)	0	11590	0.00	0	11470	0.00	0	11360	0.00
6th St S/5th Ave S (1005)	0	10530	0.00	0	10420	0.00	0	10320	0.00
6th St S/Kirkland Ave (1006)	1	10820	0.25	1	10710	0.26	1	10600	0.26

<sup>a</sup> Data summary provided by WSDOT Olympia HQ.

<sup>b</sup> Annual accidents; Intersection related.

<sup>c</sup> Total vehicles per day entering the intersection.

<sup>d</sup> Annual Accident Rate =  $[(\# \text{ of Acc})(1,000,000)]/[(\text{ADT})(365)]$

A summary of each intersection is discussed below.

For the 3-year period shown, the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St intersection has had 9 intersection related accidents over the 3-year period analyzed, thus averaging 3.00 accidents per year. The average accident rate was estimated to be 0.37 accidents per million vehicles entering; annual rates ranged between 0.12 and 0.49. This intersection is signalized. The K factor (PM to daily ratio for total entering) was assumed to be 9.0%.

At the NE 85<sup>th</sup> St/114<sup>th</sup> Ave NE intersection, over the course of the 3-year period shown, this intersection had 28 accidents, resulting in an annual average of 9.33 accidents per year. The average accident rate was estimated to be 1.00 accidents per million vehicles entering; annual rates ranged between 0.43 and 1.31. The majority of the accidents, 14 of 28, were rear end related with most being in the west to east direction. There were 11 left turn related accidents where the left turn failed to yield right of way to the thru movement. Most of these left turn related accidents, 9 of the 11, were the westbound left turn. This intersection is signalized. The K factor was assumed to be 9.0%.

At the Kirkland Way/6<sup>th</sup> St intersection, this intersection had 5 accidents over the 3-year period analyzed, resulting in an annual average of 1.67 accidents per year. The average accident rate was estimated to be 0.30 accidents per million vehicles entering; annual rates ranged between 0.18 and 0.36. This intersection is controlled by stop signs for all approaches (all-way stop). The K factor was assumed to be 8.0%.

At the NE 70<sup>th</sup> St/132<sup>nd</sup> Ave NE intersection, over the course of the 3-year period shown, this intersection had 9 accidents, resulting in an annual average of 3.00 accidents per year. The average accident rate was estimated to be 0.36 accidents per million vehicles entering; annual rates ranged between 0.12 and 0.61. This intersection is signalized. The K factor was assumed to be 10.0%.

At the NE 70<sup>th</sup> Pl/116<sup>th</sup> Ave NE intersection, this intersection had 26 accidents over the 3-year period analyzed, resulting in an annual average of 8.67 accidents per year. The average accident rate was estimated to be 0.82 accidents per million vehicles entering; annual rates ranged between 0.67 and 1.13. The majority of the accidents were rear-end, 11 total, 8 of which were from the south. Six were left turn accidents, 4 were right turn, 4 were sideswipe, and 1 was faulty equipment hitting fixed object. This intersection is signalized. The K factor was assumed to be 10.0%.

At the NE 70<sup>th</sup> Pl/I-405 SB Ramps intersection, over the course of the 3-year period shown, this intersection had only 1 reported accident resulting in an annual average of 0.33 accidents per year. The average accident rate was estimated to be 0.04 accidents per million vehicles entering. This intersection is signalized. The K factor was assumed to be 10.0%.

At the 6<sup>th</sup> St S/5<sup>th</sup> Pl S intersection, this intersection had no reported accident over the course of the 3-year period shown, resulting average accident rate of 0.0 accidents per million vehicles entering. This intersection is non-signalized (eb approach stopped). The K factor was assumed to be 10.0%.

At the 6<sup>th</sup> St S/9<sup>th</sup> Ave S intersection, this intersection reported no accident over the course of the 3-year period shown that were related to this intersection. Thus, the resulting average accident rate is 0.0 accidents per million vehicles entering. However, it should be noted that there were 2 accidents in 2011 and 2 in 2010 near this intersection but were all identified as “not intersection related”. Two of these accidents involved a vehicle parking movement, and the other two were noted as rear-end in the northbound direction, probable cause likely due to a parallel parking maneuver on 6<sup>th</sup> St S. This intersection is non-signalized (wb approach stopped). The K factor was assumed to be 10.0%.

At the 6<sup>th</sup> St S/5<sup>th</sup> Ave S intersection, this intersection had no reported accident over the course of the 3-year period shown, resulting average accident rate of 0.0 accidents per million vehicles entering. This intersection is non-signalized (eb approach stopped). The K factor was assumed to be 10.0%.

At the 6<sup>th</sup> St S/Kirkland Ave S intersection, over the course of the 3-year period shown, this intersection had 3 accidents (one per year), resulting average accident rate of 0.25 accidents per million vehicles entering. This intersection is non-signalized (wb approach stopped and eb driveway approach stopped). The K factor was assumed to be 10.0%.

## **F. City Programmed Improvements**

According to the City of Kirkland's Capital Facilities Plan, there are several proposed projects that would have an affect on the transportation issues related to the Google Phase 2 project. These projects include:

- **Cross Kirkland Corridor (Regional Trail).** The Cross Kirkland Corridor is a 5.75-mile segment of the 44-mile Eastside Rail Corridor. The Eastside Rail Corridor runs from Renton, WA to Snohomish, WA. The City purchased the Cross Kirkland Corridor from the Port of Seattle in April 2012. One of the many unique features about the Cross Kirkland Corridor is its connection to two transportation hubs. Plans are underway to develop the South Kirkland Park & Ride, which rests at the south end of the Corridor, as transit-oriented housing and retail.

Toward the northern city limits, the Corridor extends into the Totem Lake Business District, a designated Regional Urban Center. The Totem Lake Business District is home to Kirkland's largest employer, Evergreen Hospital and Medical Center, and is the focus of significant economic revitalization. When the City commissioned the Urban Land Institute (ULI) to study the Totem Lake Business District (PDF) and to make recommendations on how best to stimulate redevelopment, ULI encouraged the City to acquire and develop the abandoned railroad corridor into a regional trail and transform Totem Lake Park into a destination. With the passage of the parks property levy (Proposition 2) in 2012, funding is now available to initiate a [Master Plan process](#) for the long-term development of the Corridor. In the near term, the City has plans to construct an [interim gravel trail](#).

- **South Kirkland Park and Ride - Transit Oriented Development (TOD).** Construction of the new Park & Ride parking garage and Transit Oriented Development in the northeast corner of the South Kirkland Park and Ride is underway. The project is currently under construction. Parking will be limited during construction and KC Metro asks, "To avoid parking on adjacent properties and residential streets, transit users are asked to park at alternative locations."

The TOD development proposal includes two buildings for 239 residential units and a 295-stall parking garage

The King County METRO portion of the project includes 530 stall parking stalls, and redesign of the surface parking lot and transit loading area. At completion, the park and ride facility will increase the number of parking stalls from the existing 603 stalls to approximately 850 stalls.

- **6<sup>th</sup> St S Sidewalk Improvements.** The 6<sup>th</sup> St S improvements include connecting missing segments of sidewalk in the vicinity of the 6<sup>th</sup> St S / Kirkland Ave intersection. Improvements include a new 5' sidewalk on the east side of 6<sup>th</sup> St S

south of Kirkland Ave, a new 5' sidewalk on the north side of Kirkland Ave west of 6<sup>th</sup> St S, new ADA ramps for the existing crosswalk on the south leg of the 6<sup>th</sup> St S/Kirkland Ave intersection, and new ADA ramps and a new crosswalk across Kirkland Ave west of 6<sup>th</sup> St S.

- I-405 – NE 6<sup>th</sup> St to I-5 Widening and Express Toll Lanes. The NE 6th Street to I-5 Widening and Express Toll Lanes project will complement the widening between NE 85th Street and NE 124th Street ([Kirkland Nickel Stage 1 project](#)) by providing one continuous northbound and southbound lane between NE 6th Street in Bellevue and SR 522 in Bothell. This new lane when combined with the existing carpool lane will operate as a dual express toll lane system from downtown Bellevue to Bothell/Woodinville. Additionally, the existing carpool lane from SR 522 to I-5 will be converted to a single express toll lane or high-occupancy vehicle toll (HOT) lane.

The new express toll lane system will provide 17 miles of additional congestion relief to Bellevue, Kirkland, and Bothell. To further enhance traffic operations in the Bothell area, a northbound "braided" ramp system will be built between the NE 160th Street and SR 522 interchanges. The NE 160th Street to I-405 northbound traffic and the I-405 to SR 522 traffic will be separated from each other to provide more efficient access to I-405 and SR 522. To aid congestion on southbound I-405 in the Bothell area, WSDOT will build wider shoulders between SR 522 and NE 160th Street and between SR 527 and NE 195th Street, allowing buses to use the shoulders during peak periods.

- SR 520 – Medina/Hunts Point to SR 202: Eastside Transit and HOV Project. The Eastside Transit and HOV Project will complete and improve the 8.8-mile HOV system from Evergreen Point Road to the SR 202 interchange. The improved six-lane corridor will include two general-purpose lanes and one transit/HOV lane in each direction. The Eastside Transit and HOV Project will provide transit service and mobility improvements along with environmental and community enhancements including: 1) Regional bicycle and pedestrian path, 2) Direct-access ramp to 108th Avenue NE for carpools and transit, 3) Wider, safer shoulders, 4) Inside transit/HOV lane through the entire Eastside corridor, 5) Improvement of the Evergreen Point Road Park and Ride, and 6) Median transit stops at Evergreen Point Road and 92nd Avenue NE.
- NE 85<sup>th</sup> St/114<sup>th</sup> Ave NE Intersection Improvements. Recent improvements have been made including widening of the north leg to include dual southbound left turn lanes. Future improvements are likely to include HOV Queue Bypass lanes east and west directions. However, these additional improvements are unfunded and are not included in the horizon year of this study (2017).
- NE 68<sup>th</sup> St/108<sup>th</sup> Ave NE Intersection Improvements -- addition of a westbound right turn lane, along with new curb, gutter and 10' sidewalk around the northeast corner of

the intersection. This project was recently constructed. The benefits of this improvement are: 1) it allows the westbound through movement to travel through the intersection unimpeded by the slower turning westbound right turn movement, and 2) if there are any pedestrian crossings of the north leg, the delay to the right turn movement waiting for the pedestrian(s) to cross is removed from the westbound through movement.

- 6<sup>th</sup> St/Kirkland Way Traffic Signal (unfunded). This intersection is on the unfunded transportation list for signalization, which would involve changing the intersection control from all-way stop to a traffic signal. The project was taken off the road impact fee project list when the City had to reduce the CIP project list.

### **III. Trip Generation**

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Trip generation for the proposed Phase 2 of the Google Campus was based on driveway counts conducted at the existing Google campus for both the AM and PM street peak periods.

For the AM peak period, driveway counts were conducted Thursday 10/4/12, Tuesday 10/9/12, and Wednesday 10/10/12. The counts were conducted between 7:30am and 9:30am for the Thursday and Tuesday counts, however the count was extended to 10:00am for the Wednesday count due to a slight increase in driveway activity during the 9:15 to 9:30am interval.

For the PM peak period, the driveway counts were conducted Wednesday 10/3/12 and Tuesday 10/9/12 between 4:30pm and 6:30pm. In addition, the City provided a PM count conducted at the site Wednesday 10/19/11 that was subsequently added to the PM dataset.

All driveway counts including the City authorized count were conducted by Traffic Data Gathering (TDG). The counts included pedestrians (most of which presumed via transit) and bicycle trips. The pedestrian activity entering and exiting the site (which is likely to and from transit) is about 11% of vehicle trips for either peak hour. The percent bike trips compared to vehicle trips during the street peak times is 2 to 3%. The traffic counts conducted did not record persons per vehicle, thus it is not possible to precisely identify person trips by mode. A loose indicator of carpool/HOV trips could be in part based on preferential carpool/HOV parking stalls, which in this case of the total parking available to employees for Phase 1, about 9% is designated for carpool/HOV use. The traffic counts are summarized in Table 4.

**Table 4**  
**Google Driveway Existing Count Summaries <sup>a</sup>**

Day	Date	Pk Hr (Begin)	Driveway	LT IN	RT IN	LT OUT	RT OUT
<b>AM PEAK</b>							
Thur	10/4/2012	8:15 AM	North	29	62	8	10
Tue	10/9/2012	8:30 AM	North	32	79	10	7
Wed	10/10/2012	8:30 AM	North	21	70	5	7
			Avg	27	70	8	8
				28%	72%	49%	51%
Thur	10/4/2012	8:30 AM	South	84	10	3	13
Tue	10/9/2012	8:30 AM	South	89	10	1	6
Wed	10/10/2012	8:45 AM	South	90	11	4	11
			Avg	88	10	3	10
				89%	11%	21%	79%
BOTH DRIVEWAYS				115	81	10	18
				from the <u>south</u> 59%	from the <u>north</u> 41%	to the <u>north</u> 36%	to the <u>south</u> 64%
BOTH DRIVEWAYS <sup>b</sup>				TOTAL IN 196		TOTAL OUT 28	
TOTAL AM					224		
<b>PM PEAK</b>							
Thur	10/3/2012	5:00 PM	North	3	4	52	38
Tue	10/9/2012	5:15 PM	North	0	6	52	33
			Avg	2	5	52	36
				23%	77%	59%	41%
Thur	10/3/2012	5:00 PM	South	10	2	15	104
Tue	10/9/2012	5:15 PM	South	7	1	18	74
			Avg	9	2	17	89
				85%	15%	16%	84%
Thur	10/3/2012	Both Driveways		LT IN 13	RT IN 6	LT OUT 67	RT OUT 142
Tue	10/9/2012	Both Driveways		7	7	70	107
Wed	10/19/2011 <sup>c</sup>	Both Driveways		9	6	78	71
			Avg	10	6	72	106
				from the <u>south</u> 60%	from the <u>north</u> 40%	to the <u>north</u> 40%	to the <u>south</u> 60%
BOTH DRIVEWAYS <sup>b</sup>				TOTAL IN 16		TOTAL OUT 178	
TOTAL PM					194		

<sup>a</sup> for both the north and south driveways.

<sup>b</sup> volumes ultimately rounded for "both driveways" totals.

<sup>c</sup> Count authorized by City, conducted October 2011 (data only available for summary of both driveways)

As shown in Table 4, for the AM peak hour, the total trips to/from the site was found on average to be 224 trips, with 196 in and 28 out. The peak hour in general is between 8:30 and 9:30 am which is slightly outside the typical AM street peak. The volume across

each driveway is split almost equally. Approximately 60% of the vehicles entering and exiting are to/from the south on 6<sup>th</sup> St S, and most of the vehicle trips to/from the south use the south driveway. For the PM peak hour, the total trips to and from the site was observed to be 194 trips, with 178 exiting and 16 entering. In general, the PM peak hour is between 5:15 and 6:15. The orientation of trips is 60% to and from the south on 6<sup>th</sup> St S, and 40% to and from the north.

Based on this count information, a local trip generation rate was determined for both the AM and PM peak hours for use in estimating trips for the Phase 2 project. The derivation of the local rates are as follows:

1. AM Peak Hour: The AM street peak hour volume for Phase 1 of the Google Campus is 224 trips. The gross floor area is 194,825 gsf. Thus, the AM street peak hour trip rate is 1.15 AM peak hour trips per ksf. The directional distribution split is 87% entering and 13% exiting. This rate and directional distribution percentages were used to estimate the AM street peak hour trips for Phase 2.
2. PM Peak Hour: The PM street peak hour volume for Phase 1 of the Google Campus is 194 trips. Using the same gross floor area of 194,825 gsf, this equates to a PM street peak hour trip rate of 1.00 PM peak hour trips per ksf. The directional distribution split is 8% entering and 92% exiting. This rate and directional distribution percentages were used to estimate the PM street peak hour trips for Phase 2.

The daily estimate was based on subsequent 24-hour counts conducted at each driveway for entering and exiting traffic. The counts were conducted between Tuesday October 23, 2012 and Thursday October 25, 2012. The 3-day average indicated a daily volume of 1,822 trips both in and out. Approximately 43% of these trips were at the north driveway and 57% were at the south driveway. Figure 10a below shows the average daily volume activity by hour of day for entering, exiting and total volume, for the existing campus.

Assuming a gross floor area of 194,825 gsf, the daily trip rate for the existing Google Campus is approximately 9.35 trips per ksf. This was the rate used to estimate the daily trips for Phase 2.

It is important to note that for this study, “trips” refers to motorized vehicles either heading to the site (trip destination aka arrival), or leaving from the site (trip origination aka departure).

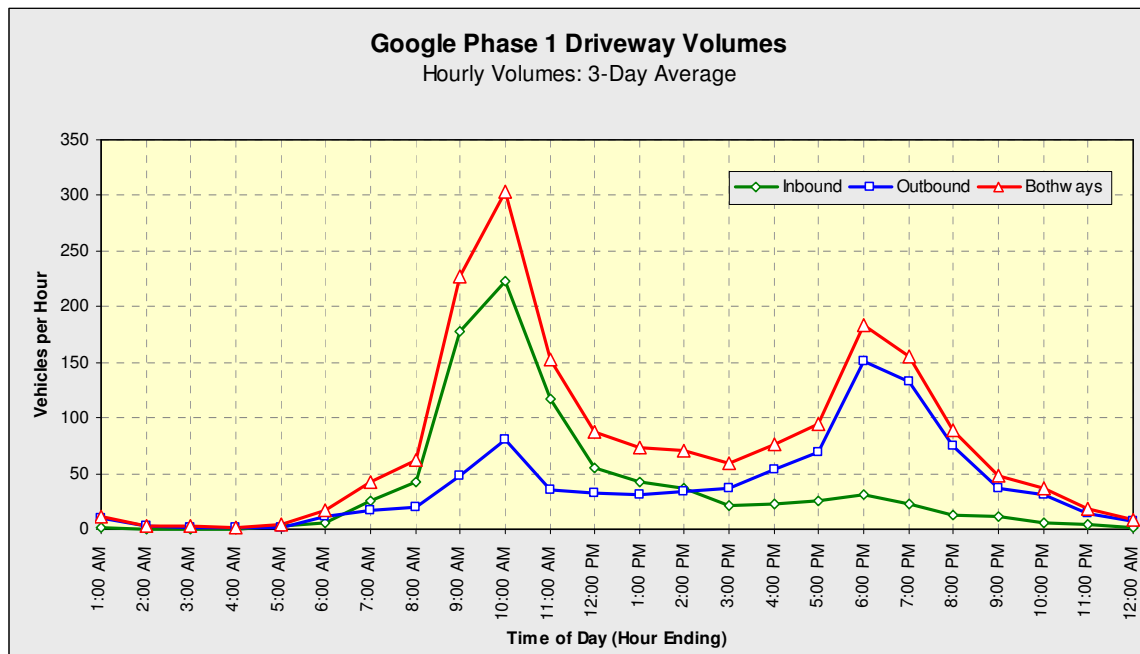


Figure 10a

As shown in Figure 10a, there is a more predominant spike in inbound traffic arriving at the site than outbound trips exiting the site. Assuming that all “Inbound” equals all “Outbound” for a typical day, this figure suggests that employees are arriving at work in a shorter time duration than when they leave work, ie., vehicles exiting the site in the evening are more spread out. Figure 10a also shows that the AM peak hourly volume for the site peak at approximately 300 vehicles around the 9 to 10 AM hour. This is outside the normal AM peak hour for adjacent street traffic, which is typically a 1-hour period between 7 and 9 am.

These local trip rates and distribution percentages (in/out splits) were utilized to estimate the daily and peak hour trips for the proposed Phase 2 project. The trip generation estimates for Phase 2 are presented in Table 5.

**Table 5**  
**Google Phase 2 Trip Generation Estimates <sup>a</sup>**

Land Use	AWDT	AM Peak			PM Peak			
		Total	In	Out	Total	In	Out	
Proposal: Google Campus Phase 2 Office								
180 ksf	Rate	9.35	1.15	87%	13%	1.00	8%	92%
	Vol	1,684	207	181	26	180	15	165

<sup>a</sup> trip rates for Daily, AM and PM peak hours based on local rates obtained from local counts from Phase 1.

As shown in Table 5, the Google Campus Phase 2 project is estimated to generate a total of 1,684 daily, 207 AM and 180 PM peak hour trips to and from the site. The City's concurrency test used the PM peak hour volume estimate of 16 in and 165 out for it's test.

Figure 10b below shows the average daily volume activity by hour of day for entering (In), exiting (Out), and total volume (In & Out), for the Phase 2 development.

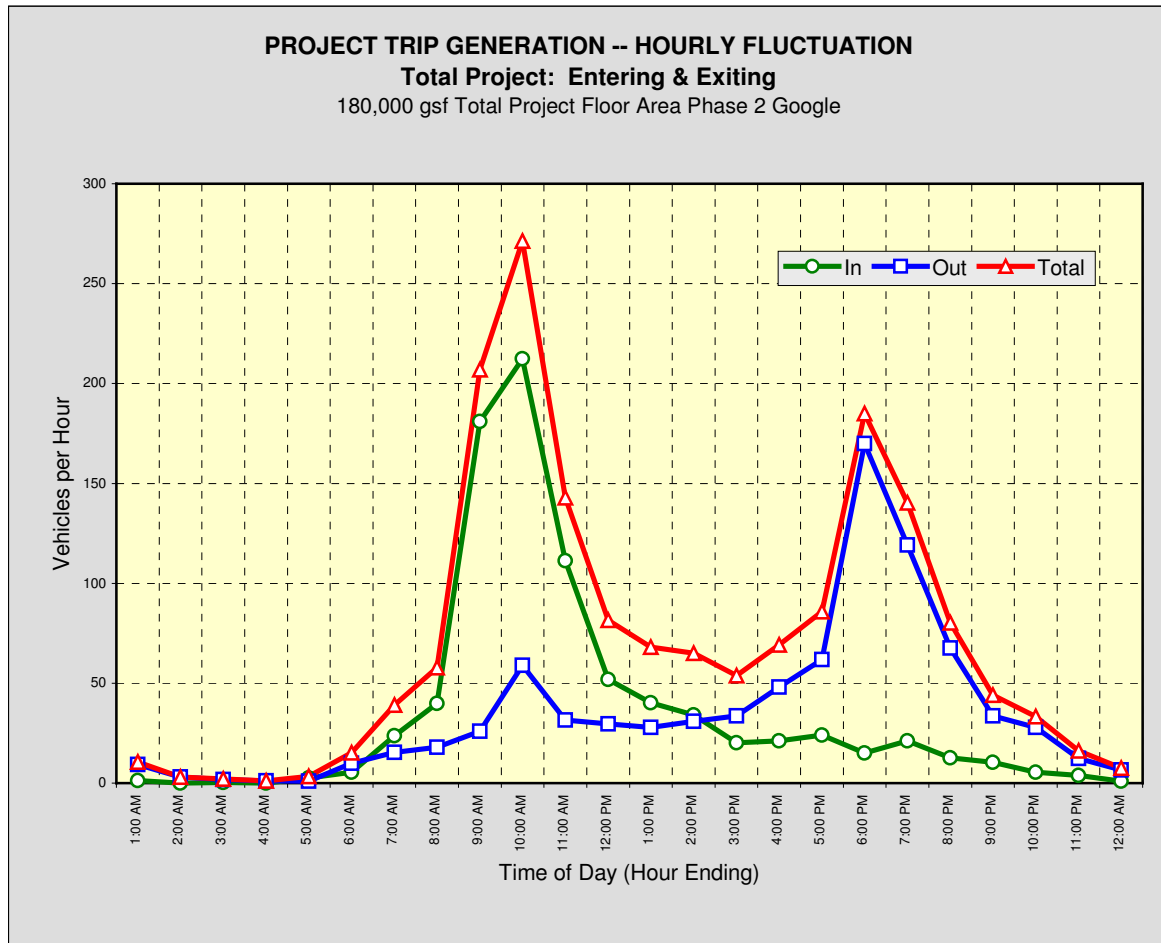


Figure 10b

By way of comparison, the trip generation rates per the Eighth Edition of the ITE *Trip Generation Report*, 2008, for General Office and Corporate Headquarters Building which are based on averages for sites nationwide, are higher for the peak hour estimates but similar for the daily rate. These are all show in Table 6.

**Table 6**  
**Trip Generation Comparison with ITE <sup>a</sup> (Average Trip Rate)**

Land Use	AWDT	AM Peak			PM Peak		
		Total	In	Out	Total	In	Out
Local Rates for Google Campus (Phase 1) <sup>b</sup>							
Rate	9.35	1.15	87%	13%	1.00	8%	92%
ITE LUC 710 – General Office							
Rate	11.01	1.55	88%	12%	1.49	17%	83%
ITE LUC 714 – Corporate Headquarters Building							
Rate	7.98	1.49	93%	7%	1.40	10%	90%

<sup>a</sup> local trip rates for Phase 1 compared against ITE trip generation rates for office type uses.

<sup>b</sup> local trip rates for Phase 1 reflect an average of a 3-day data set.

According to Table 6, the local volumes at the existing Google campus and subsequent trip rates are less than ITE rates for peak hour conditions and similar to ITE rates for daily trip estimates.

## IV. Trip Distribution and Assignment

The distribution and assignment of project PM peak hour trips was performed by the City using the City's traffic model as part of the transportation concurrency test. The PM assignment was partially based on the existing traffic counts at the driveways provided to the City. The AM trip assignment was conducted by WPA and was, as instructed by City, a reversal of the PM percentages.

The results for the City's PM traffic assignment suggest the general following distribution at the project site:

- 49% of the project trips would enter/exit the site to/from the north on 6<sup>th</sup> Street S.
- 51% of the project trips would enter/exit the site to/from the south on 6<sup>th</sup> Street S.

It was assumed that 58% of the trips entering/exiting the Phase 2 site would be from the existing south Google driveway to 6<sup>th</sup> St S. Thus 42% of the project trips would enter/exit the site from 5<sup>th</sup> Pl S. This slight imbalance between driveways to Phase 2 assumes most of the guest/visitor and vendor trips would use the existing Google driveway versus 5<sup>th</sup> Pl S. It was assumed that no trips from Phase 2 would use the north driveway of Phase 1.

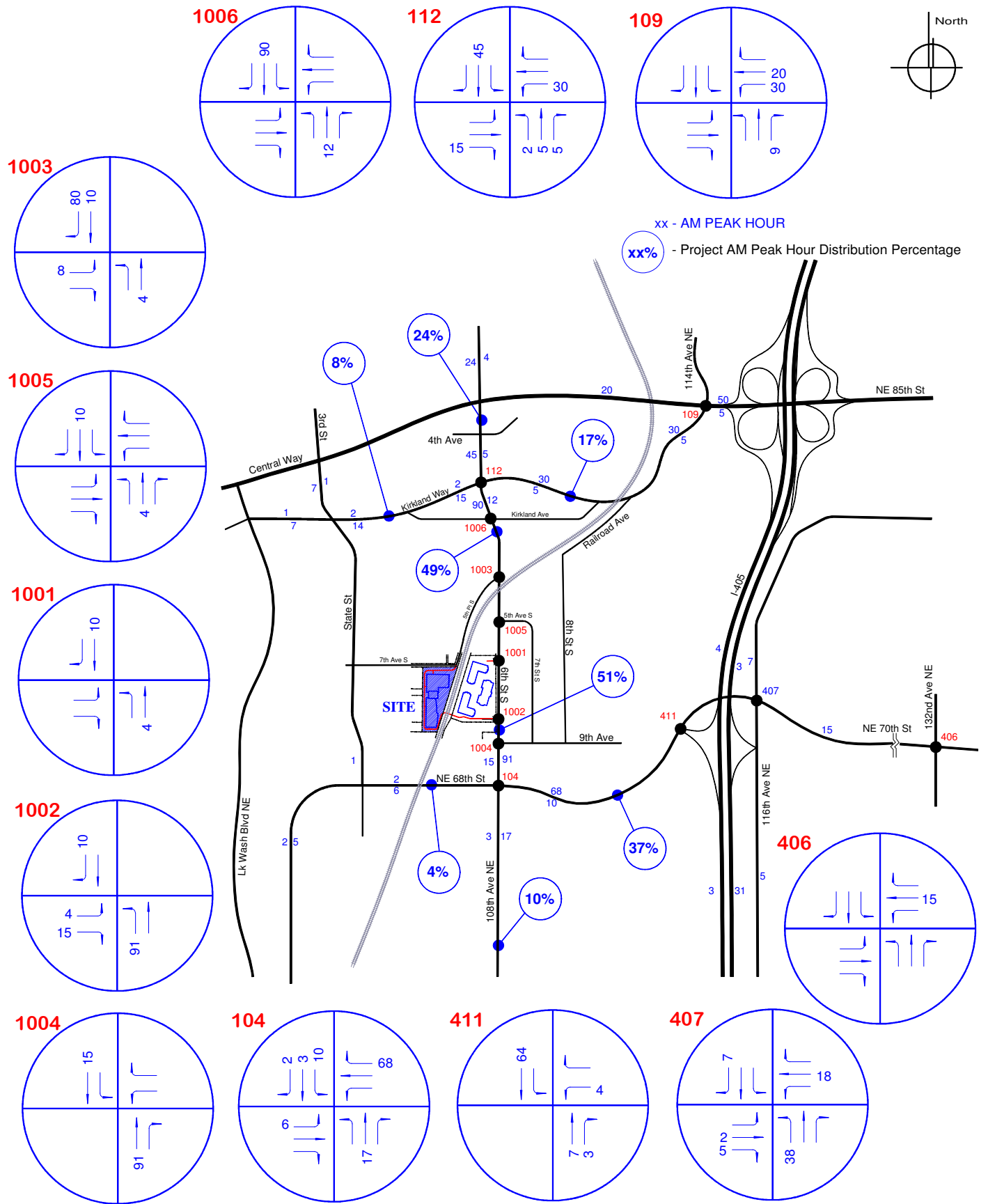
The outlying distribution is as follows:

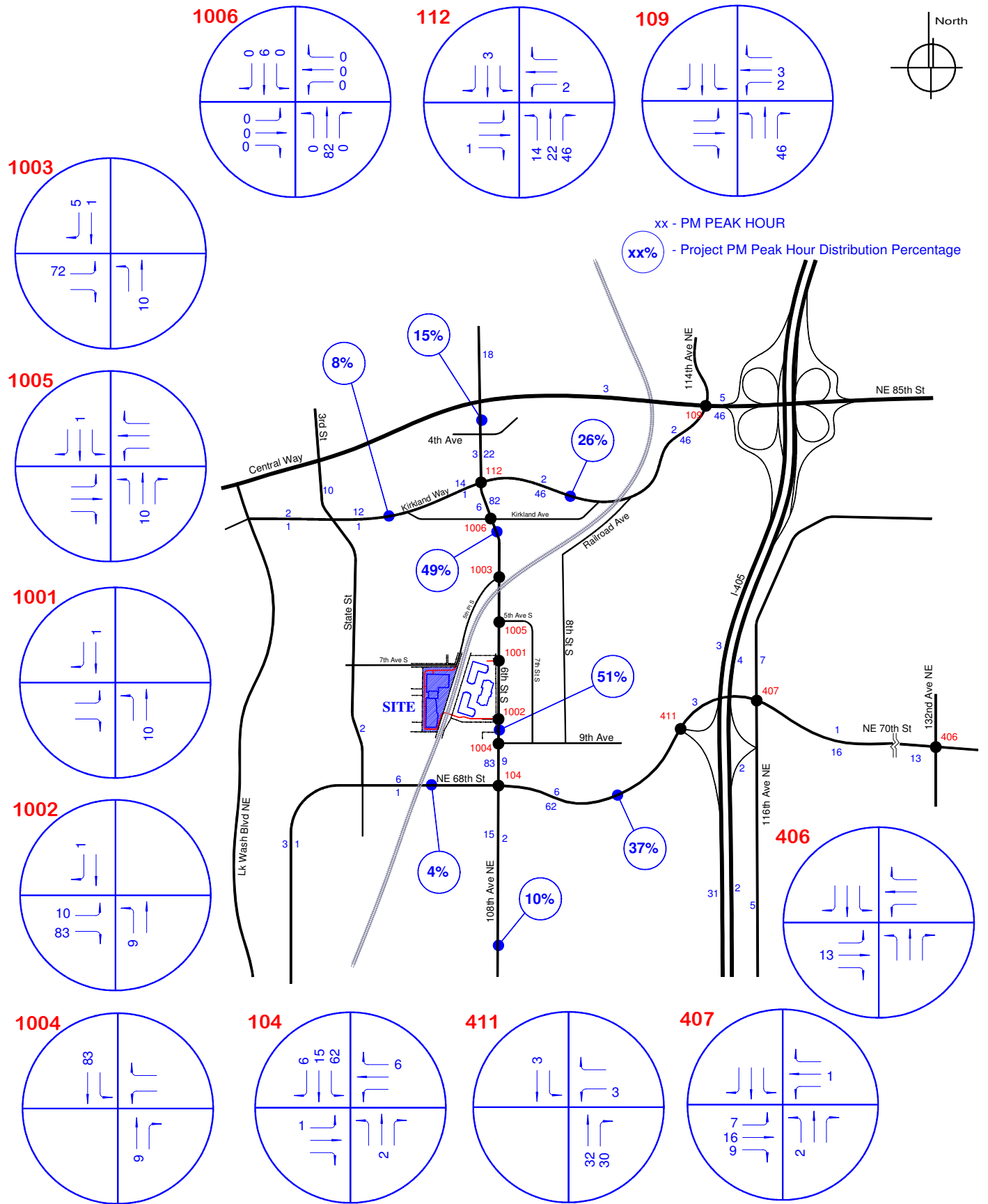
- South via 6<sup>th</sup> St S (51%) --
  - 37% of the project trips are to/from the east on NE 68<sup>th</sup> St.
  - 10% of the project trips are to/from the south on 108<sup>th</sup> Ave NE.
  - 4% of the project trips are to/from the west on NE 68<sup>th</sup> St.
- North via 6<sup>th</sup> St S (49%) --
  - 26% of the project trips are to/from the east on Kirkland Way (and Kirkland Ave) to NE 85<sup>th</sup> St (west of I-405).
  - 15% of the project trips are to/from the north on 6<sup>th</sup> St north of Kirkland Way.
  - 8% of the project trips are to/from the northwest on Central Way, Market St, Kirkland Way, and Lake St.

As mentioned earlier, the Phase 2 project will have direct access to 5<sup>th</sup> Pl S as well as to the south end of the existing campus, which ultimately will use the south Google driveway to 6<sup>th</sup> St S. It is estimated that no significant amount of traffic from the Phase 2 project will use the existing north Google driveway due to the circuitous travel through the Phase 1 campus. The local area trip assignment on 6<sup>th</sup> St S assumed approximately 90% of the traffic that is to and from the north would use 5<sup>th</sup> Pl S and 10% would use the existing campus south driveway. All of the trips from Phase 2 to and from the south via 6<sup>th</sup> St S are expected to use the existing campus south driveway.

Given the increase in traffic at the south driveway from Phase 2, it is anticipated that some of the existing Google traffic (Phase 1 trips) that typically use the south driveway may divert away from the south driveway to the north driveway for ingress/egress. However, for a worst-case scenario analysis of driveway conditions (as well as signal warrant analyses) at the south driveway, the anticipated diversion of some existing campus traffic to the north driveway was assumed to be zero.

The assignment of project weekday daily, AM and PM peak hour trips for Phase 2 are shown in Figures 11a and 11b respectively. It is important to note that the PM peak hour trip assignment was taken verbatim from the City's concurrency run.





## **V. Transportation Concurrency (Concurrency Management)**

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With the adoption of the Growth Management Act in 1991, the State Legislature introduced the term “Concurrency Management”, meaning that capital facilities shall be “concurrent” with new development or redevelopment. The Growth Management Act requires each City to determine which capital facilities shall be “concurrent.” The City of Kirkland has determined that water, sewer, and the adopted Level of Service for traffic are the capital facilities, which shall be “concurrent.” This means that capital facilities must be available at locally established Levels of Service with completion of new development. Kirkland’s Levels of Service are identified in the adopted Comprehensive Plan. The concurrency review will check to ensure that waste and sewer mains exist or will be constructed with each project and that the established traffic Level of Service at certain intersections will be maintained.

The City of Kirkland conducted a traffic concurrency test for this project and provided the results in a memorandum to the Planning Department dated 10/29/12. The memorandum and concurrency results are attached. The project passed concurrency. The concurrency test notice shall expire and a new concurrency test application is required unless:

1. A complete SEPA checklist, traffic impact analysis and all require documentation are submitted to the City within 90 calendar days of the concurrency test notice
2. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test notice. A Certificate of Concurrency is issued at the same time a development permit or building permit is issued if the applicant holds a valid concurrency test notice.

Please refer to the Technical Appendix for additional details including expiration dates.

There are five subareas defined as part of concurrency. No designated concurrency intersection can exceed a v/c ratio of 1.4, and the subarea v/c ratio cannot exceed the defined threshold. The concurrency test results for this development indicate no concurrency intersection will exceed a v/c of 1.4 and all of the subareas are below thresholds. The subarea v/c standards and concurrency results are:

- The Southwest v/c standard is 0.90. The v/c with project is 0.64. Pass
- The Northwest v/c standard is 0.94. The v/c with project is 0.78. Pass
- The Northeast v/c standard is 0.92. The v/c with project is 0.74. Pass
- The East v/c standard is 1.07. The v/c with project is 0.88. Pass
- The North subarea does not have a subarea v/c threshold. N/a

The concurrency test was run with a trip generation assumption of 180 PM peak hour trips, with 165 out, and 15 in.

## **VI. Significant Traffic Impact (at Key Arterial Intersections)**

The City's analysis guidelines require analysis of all intersections where the project's proportional share is greater than 1%. These intersections are defined as significant intersections.

Based on project trip distribution and assignment, there are six intersections that are identified as significant. All intersections reviewed and those defined as significant, or not, are shown in Table 7. The intersections reviewed included all intersections identified in the concurrency run.

Mitigation for SEPA impacts as defined by the City of Kirkland's Traffic Impact Analysis Guidelines indicate that mitigation improvements are required at any intersection where: 1) the LOS is E and the project's proportional share impact is greater than 15%, or 2) the LOS is F and the project's proportional share impact is greater than 5%. No mitigation is required where the LOS is D or better.

**Table 7**  
**Significant Intersection Check**

	Intersection	Project AWDT <sup>a</sup>	Proportional Share <sup>b</sup>	Significant? <sup>c</sup>
101	Lake Wash/NE 38th Pl	19	0.1%	No
102	Lake Wash/Lakeview Dr	28	0.2%	No
103	State St/NE 68th St	56	0.2%	No
<b>104</b>	<b>108th Ave NE/NE 68th St</b>	<b>805</b>	<b>5.4%</b>	<b>Yes</b>
105	Central Way/6th St	215	0.6%	No
106	Central Way/3rd St	94	0.9%	No
107	Central Way/Lake St	9	0.1%	No
108	Lake St/Kirkland Ave	9	0.1%	No
<b>109</b>	<b>NE 85th St/114th Ave NE</b>	<b>486</b>	<b>2.7%</b>	<b>Yes</b>
110	6th St/4th Ave	253	0.8%	No
111	Kirkland Ave/3rd Ave	122	0.8%	No
<b>112</b>	<b>Kirkland Way/6th St</b>	<b>851</b>	<b>4.1%</b>	<b>Yes</b>
201	98th Ave NE/Juanita Dr	225	0.8%	No
202	100th Ave NE/NE 124th St	122	0.3%	No
203	100th Ave NE/NE 132nd St	112	0.3%	No
205	Market St/Forbes Creek	234	0.7%	No
206	98th Ave NE/NE 120th Pl	122	0.3%	No
207	Juanita Drive/93rd Ave NE	65	0.2%	No
208	Juanita Dr/97th Ave NE	75	0.2%	No
301	120th Ave NE/NE 132nd St	19	0.1%	No
302	120th Ave NE/NE 130th St	19	0.1%	No
303	120th Ave NE/NE 128th St	37	0.1%	No
304	NE 132nd St/124th Ave NE	37	0.3%	No
306	NE 124th St/ Slater Ave NE	65	0.4%	No
307	Totem Lake Blvd/120th Ave NE	37	0.1%	No
310	NE 116th St/120th Ave NE	19	0.1%	No
311	NE 116th St/124th Ave NE	112	0.5%	No
312	NE 124th St/116th Ave NE	9	0.0%	No
313	NE 124th St/113th Pl NE	19	0.0%	No
314	Slater Ave NE/NE 120th St	28	0.1%	No
315	NE 124th St/124th Ave NE	19	0.0%	No
316	Totem Lake Blvd/NE 132nd St	19	0.1%	No
317	I-405/SB Off NE 124th St	9	0.0%	No
318	I-405/NB Off NE 124th St	19	0.1%	No
319	I-405/SB Off NE 116th St	37	0.2%	No
320	I-405/NB Off NE 116th St	56	0.2%	No
324	NE 128th St/116th Way NE	0	0.0%	No
325	NE 124th St/128th Ln NE	37	0.1%	No
401	NE 85th St/ 132nd Ave NE	65	0.2%	No
402	NE 85th St/124th Ave NE	131	0.8%	No
403	NE 85th St/ 120th Ave NE	112	0.4%	No
404	124th Ave NE/NE 100th St	112	0.3%	No
<b>406</b>	<b>NE 70th St/132nd Ave NE</b>	<b>131</b>	<b>1.3%</b>	<b>Yes</b>
<b>407</b>	<b>NE 70th St/116th Ave NE</b>	<b>337</b>	<b>2.7%</b>	<b>Yes</b>
410	116th Ave NE/I-405 NB Ramp	103	0.4%	No
<b>411</b>	<b>NE 70th Pl/I-405 SB Ramp</b>	<b>655</b>	<b>2.6%</b>	<b>Yes</b>
501	North Holmes Pt Dr NE/Juanita Dr NE	28	0.1%	No
502	South Holmes Pt Dr NE/Juanita Dr NE	37	0.1%	No
503	NE 141st Street/Juanita Dr NE	28	0.1%	No
504	Juanita-Woodinville Way/100th Ave NE	112	0.3%	No
506	Simonds Road/100th Avenue NE	65	0.2%	No
507	NE 145th street/100th Avenue NE	56	0.2%	No
508	NE 145th Street/Juanita-Woodinville Way	37	0.3%	No
510	NE 132nd Street/132nd Avenue NE	28	0.1%	No
511	NE 144th Street/124th Avenue NE	9	0.0%	No
512	NE 124th Street/Willows Road NE	37	0.1%	No

a Total daily trips entering intersection.

b Based on the City of Kirkland Proportional Share Impact Worksheet.

c A significant intersections defined as any intersection where the proportional share is equal to or exceeds 1.0%.

According to the results shown in Table 7, there are 6 intersections that meet the criteria to be defined as a significant intersection, ie., greater than 1%. It is important to note that at one intersection the proportional share project impact exceeds 5%. The remaining intersections are determined not to be significant. The full list shown in Table 7 includes all those intersections reported in the City's concurrency results.

Thus, the six intersections that require additional analysis are:

104	108th Ave NE/NE 68th St
109	NE 85th St/114th Ave NE
112	Kirkland Way/6th St
406	NE 70 <sup>th</sup> St/132 <sup>nd</sup> Ave NE
407	NE 70th St/116th Ave NE
411	NE 72nd Pl/I-405 SB Ramp

The analysis also includes analysis of the six local area intersections on 6<sup>th</sup> St S. For reference purposes, these intersections were identified with 1000's number coding. They are:

1001	6 <sup>th</sup> St S/Google North Driveway
1002	6 <sup>th</sup> St S/Google South Driveway
1003	6 <sup>th</sup> St S/5 <sup>th</sup> Pl S
1004	6 <sup>th</sup> St S/9 <sup>th</sup> Ave S
1005	6 <sup>th</sup> St S/5 <sup>th</sup> Ave S
1006	6 <sup>th</sup> St S/Kirkland Ave

These intersections were analyzed for both the AM and PM street peak periods.

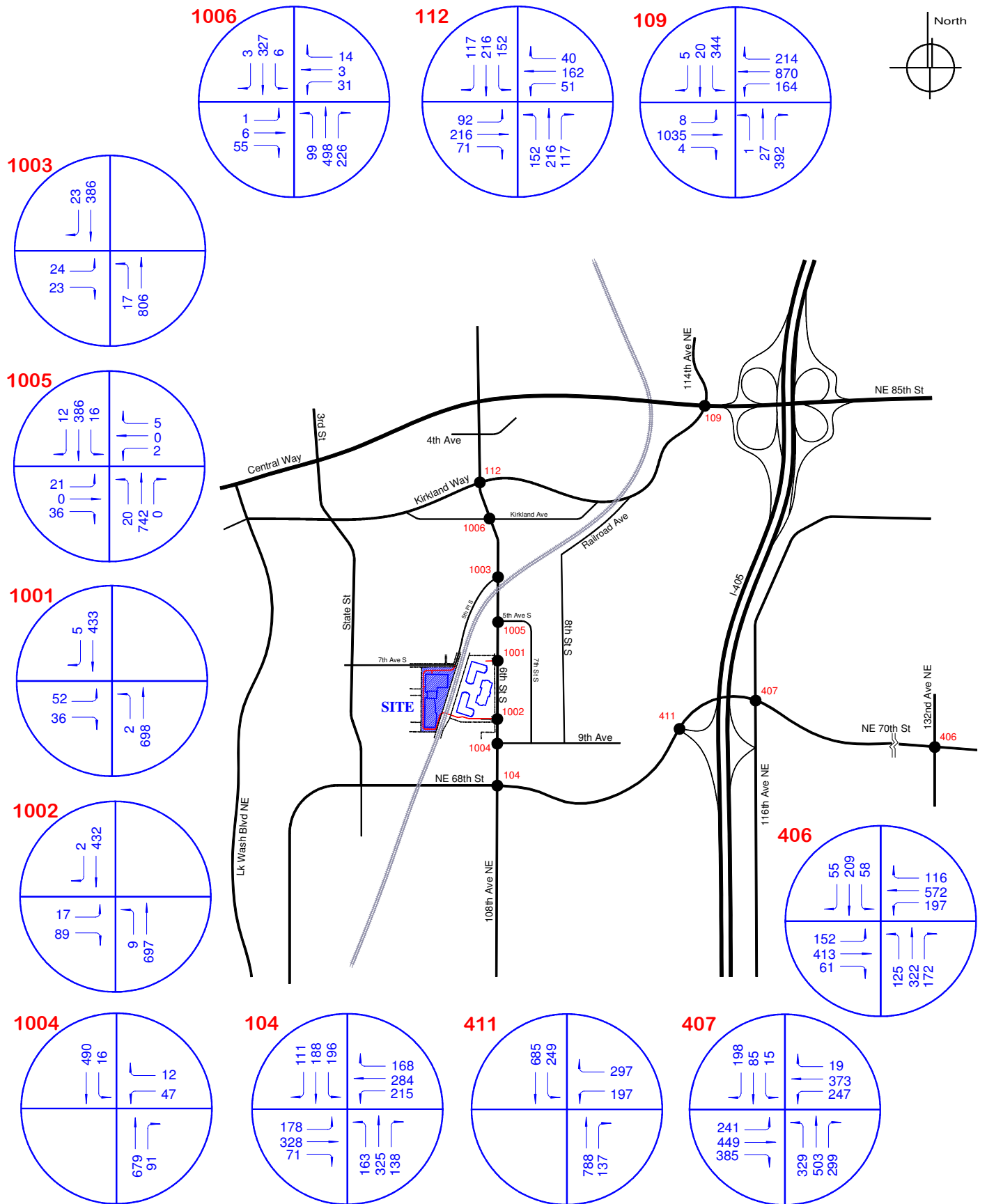
## **VII. Future Year (Year 2017) Traffic Estimates**

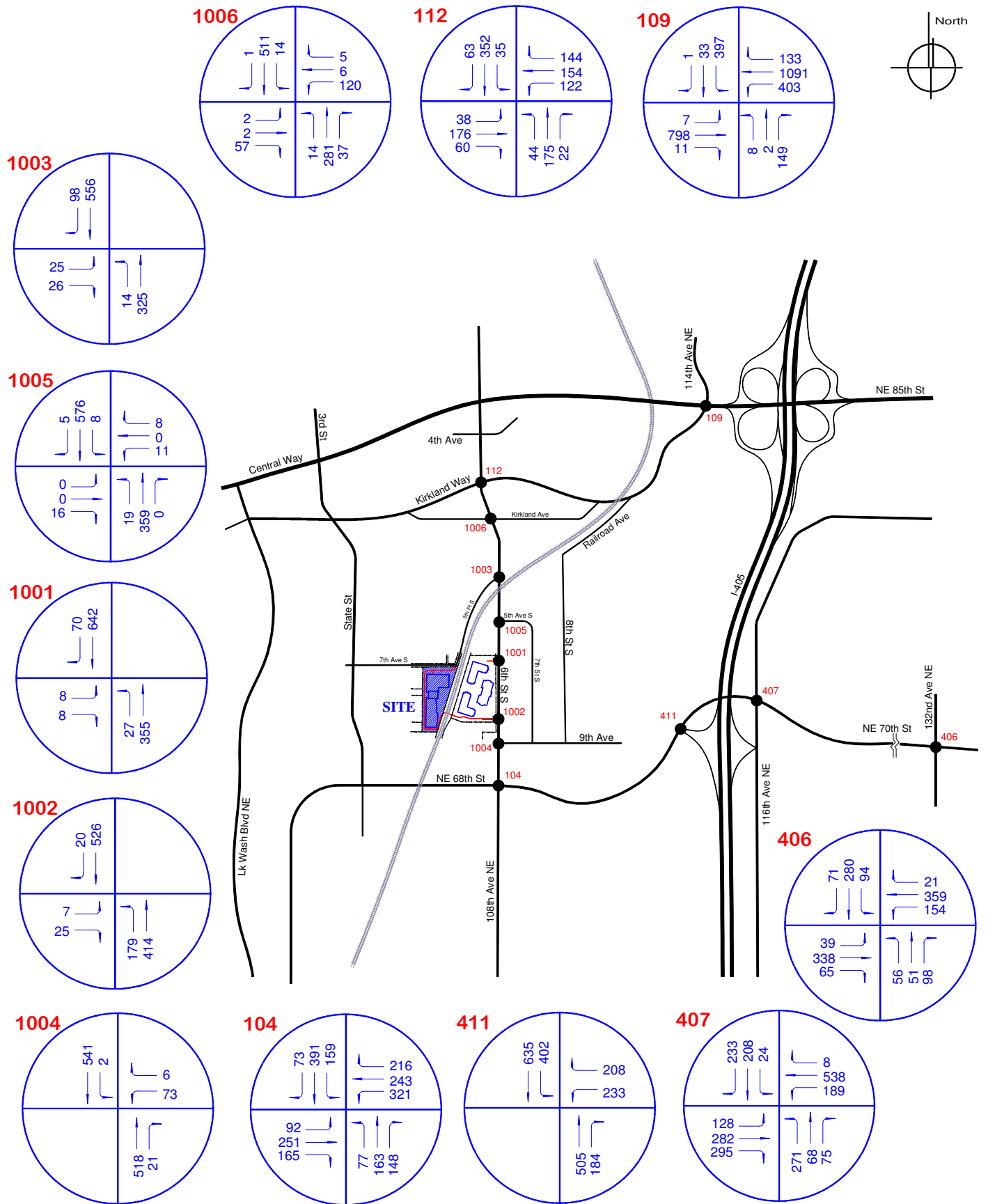
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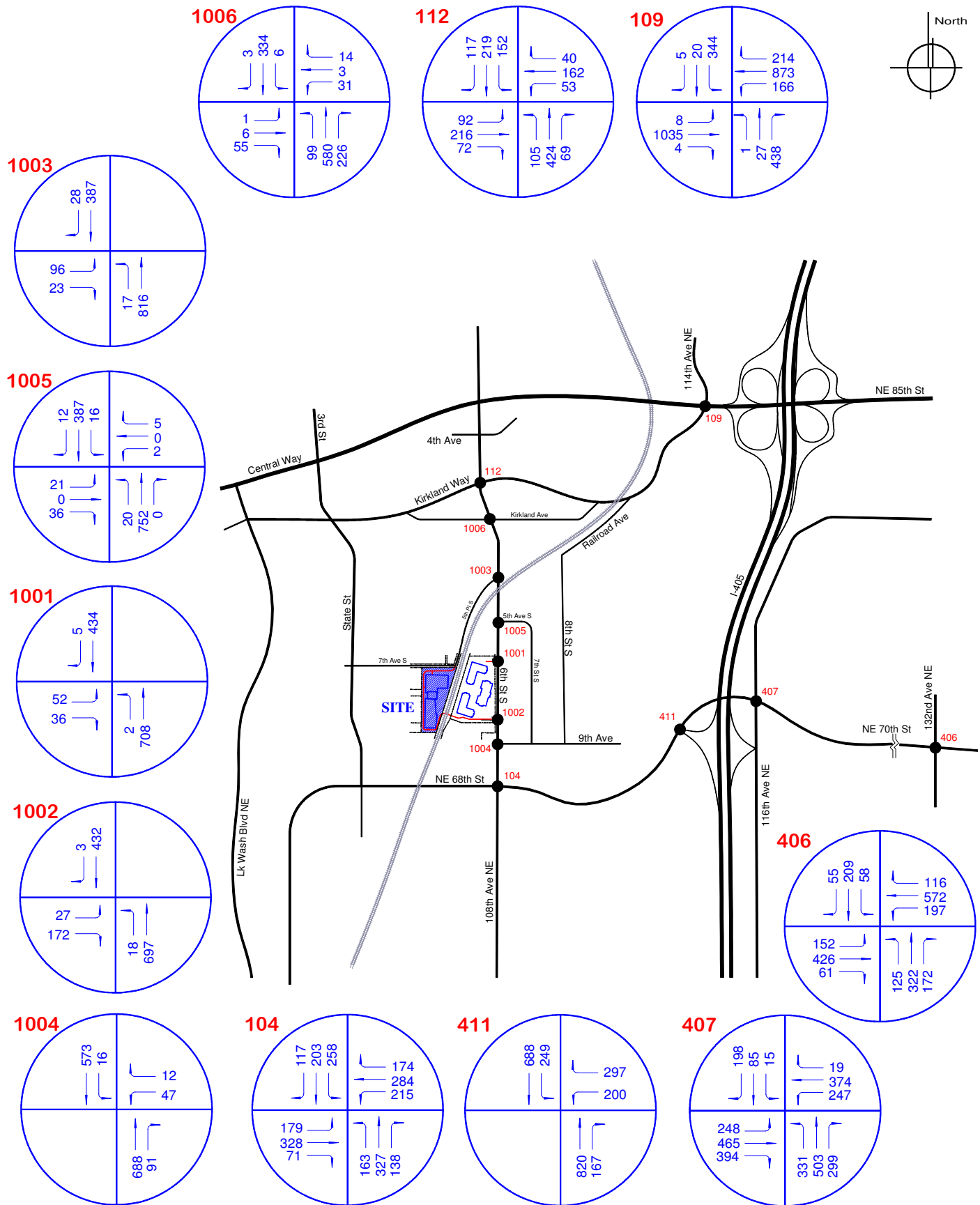
The horizon year of this project is estimated to be 2 to 3 years from today, however, the traffic study assumes a 2017 horizon year to coincide with the concurrency forecasts. The City provided AM and PM peak hour background traffic volume forecasts for the year 2017 (includes traffic growth from all concurrency approved pipeline projects) for key arterial-arterial intersections 104, 109, 112, 406, 407 and 411. Traffic counts

The future year volumes at the analysis intersections without the project are shown in Figure 12a and 12b for the AM and PM peak hours respectively. The future year turning movement volumes at the analysis intersections with the project are shown in Figure 13a and 13b, for AM and PM peak hours respectively. In addition, the AM and PM peak hour at all of the local area intersections are shown in these same figures.









The traffic volumes for the intersections along the 6<sup>th</sup> St S corridor between Kirkland Way and NE 68<sup>th</sup> St are shown below in Table 8. These volumes identify the total entering vehicles for either the AM or PM street peak hour for existing and future conditions.

**Table 8**  
**Total Entering Volume Estimates**

Intersection <sup>b</sup>	AM PEAK HOUR			PM PEAK HOUR		
	Existing 2012	2017 without Project	2017 with Project	Existing 2012	2017 without Project	2017 with Project
104 NE 68th St/108th Ave NE						
Total Entering Volume	2,012	2,193	2,299	2,040	2,365	2,460
Growth		181	106		325	95
% growth		9%	5%		16%	4%
112 Kirkland Way/6th Street						
Total Entering Volume	1,038	1,283	1,385	1,236	1,633	1,724
Growth		245	102		397	91
% growth		24%	8%		32%	6%
1001 6th St S / North Driveway						
Total Entering Volume	943	1,095	1,109	1,039	1,226	1,238
Growth		152	14		187	12
% growth		16%	1%		18%	1%
1002 6th St S / South Driveway						
Total Entering Volume	901	1,051	1,171	1,059	1,246	1,353
Growth		150	120		187	107
% growth		17%	11%		18%	9%
1003 6th St S / 5th Pl S						
Total Entering Volume	796	947	1,049	1,092	1,279	1,370
Growth		151	102		187	91
% growth		19%	11%		17%	7%
1004 6th St S / 9th Ave S						
Total Entering Volume	906	1,062	1,168	1,159	1,346	1,441
Growth		156	106		187	95
% growth		17%	10%		16%	7%
1005 6th St S / 5th Ave S						
Total Entering Volume	835	988	1,002	1,053	1,240	1,252
Growth		153	14		187	12
% growth		18%	1%		18%	1%
1006 6th St S / Kirkland Ave						
Total Entering Volume	798	949	1,051	1,082	1,269	1,360
Growth		151	102		187	91
% growth		19%	11%		17%	7%

a Refer to turning volume figures for turn movement details.

## VIII. Level of Service Analysis

Level-of-service (LOS) is a term defined by transportation and traffic engineers as a qualitative and quantitative measure of operational conditions within a traffic stream and the perception of these conditions by motorists and/or passengers. There are several quantitative indices utilized depending on the type of intersection control present. There are six levels-of-service that are given letter designations from "A" to "F", with "A" being the best, or minimum delay conditions, and "F" being the worst, with maximum delay or jammed conditions. LOS "C" or "D" is generally considered acceptable for planning and design purposes, while LOS "E" represents operating conditions at or near capacity with freedom to maneuver being extremely difficult.

Level-of-service for the existing conditions, as well as future conditions, were calculated using Trafficware's Synchro software. This software replicates the analytical procedures specified in the Highway Capacity Manual. Level-of-service for signalized and non-signalized intersections is quantified in terms of vehicular delay. Delay, measured in terms of time (seconds), also represents driver discomfort, frustration, excess fuel consumption and lost travel time. Level-of-service criteria and definitions for signalized and non-signalized intersections are presented in Table 9.

**Table 9**  
**Intersection Level-of-Service Criteria**

Level of Service	Definition	Stopped Delay Per Vehicle <sup>1</sup>	
		signalized	non-signalized
A	Little or no delay	Less than 10.0 sec	Less than 10.0 sec
B	Short traffic delays	10.1 to 20 sec	10.1 to 15 sec
C	Average traffic delays	20.1 to 35 sec	15.1 to 25 sec
D	Long traffic delays	35.1 to 55 sec	25.1 to 35 sec
E	Very long traffic delays	55.1 to 80 sec	35.1 to 50 sec
F	Extreme delay	Greater than 80 sec	Greater than 50 sec

<sup>1</sup> Delay; seconds per vehicle

Note that for signalized intersections (and all-way stop controlled intersections), the LOS and delay presented in the level of service tables below represent the overall operation of the intersection, whereas the LOS and delay presented for an unsignalized intersection (side street stop control) represents the delay for the stopped approach only.

Level of service was calculated at the study area intersection for existing 2012, 2017 with and without project conditions. The future (year 2017) weekday AM and PM peak hour level of service at the six local area intersections on 6<sup>th</sup> St S was also computed. The results are shown in Table 10a for AM results and 10b for PM results.

**Table 10a**  
**AM Peak Hour Level of Service**

Intersection <sup>b</sup>			2012/13 Existing LOS (Delay) <sup>a</sup>		2017 without project LOS (Delay) <sup>a</sup>		2017 with project LOS (Delay) <sup>a</sup>	
KEY INTERSECTIONS (per Proportionate Share Impact %)								
104	108th Ave NE/NE 68th St	overall	D	37	D	39	D	39
109	NE 85th St/114th Ave NE	overall	C	27	C	34	C	34
112	Kirkland Way/6th St S	overall	C	17	E	36	F B	60 11 <sup>g</sup>
406	NE 70th St/132 <sup>nd</sup> Ave NE	overall	B	20	C	21	C	21
407	NE 70th St/116th Ave NE	overall	D	44	D	52	E	57
411	NE 72nd Pl/I-405 SB Ramp	overall	B	16	B	18	B	18
LOCAL AREA INTERSECTIONS								
1001	6 <sup>th</sup> St S/North Driveway <sup>c</sup>	EBL/EBR	B	14	B	15	B	15
		NBL	A	9	A	10	A	10
1002	6 <sup>th</sup> St S/South Driveway <sup>c</sup>	EBL/EBR	B	12	B	13	B	14
		NBL	A	9	A	9	A	10
1003	6 <sup>th</sup> St S/5 <sup>th</sup> Pl S <sup>c,d</sup>	EBL/EBR	B	13	B	14	C	15+
		NBL	A	9	A	9	A	9
1004	6 <sup>th</sup> St S/9 <sup>th</sup> Ave S <sup>e</sup>	WBL/WBR	C	21	C	29	D C	35 19 <sup>h</sup>
		SBL	A	8	A	9	A	9
1005	6 <sup>th</sup> St S/5 <sup>th</sup> Ave S <sup>f</sup>	EB	B	13	B	13	B	13
		WB	C	18	C	20	C	21
		NB	A	1	A	1	A	1
		SB	A	1	A	1	A	1
1006	6 <sup>th</sup> St S/Kirkland Ave <sup>f</sup>	EB	B	12	B	12	B	14
		WB	D	25+	E	42	F	64
		NB	A	1	A	1	A	1
		SBL	A	1	A	1	A	1

- a Delay is represented in seconds per vehicle; all delay has been rounded to the nearest second. See Table 9 for thresholds. Any delay just over the LOS threshold is noted with a "+".
- b Intersections 104, 109, 406, 407 and 411 are signalized. Intersection 112 is an all-way stop. Intersections 1001, 1002, 1003, 1004, 1005, and 1006 are side street stop control (main line is 6<sup>th</sup> St S, northbound-southbound).
- c Intersections 1001, 1002 and 1003 are tee-intersections with stop control for the EB approach. At 1001 and 1002, there are short separate left and right turn pockets. 1001 and 1002 also assume 1 vehicle storage in center turn lane.
- d There is a short eastbound left turn center refuge area and the analysis considers 1 vehicle storage, functioning similar to a two-way left-turn lane. Even though not striped, there is adequate storage for a northbound left turn pocket, also assumed in the analysis.
- e Intersection 1004 is a tee-intersection with stop control for the WB approach. There is no center refuge area on the south leg.
- f Intersections 1005 and 1006 are four-way intersections with stop control for the east and west legs. The west leg of 1005 is a driveway.
- g with signal (no lane additions)
- h with extension of two-way left-turn lane south to NE 68<sup>th</sup> St

**Table 10b**  
**PM Peak Hour Level of Service**

Intersection <sup>b</sup>		Approach/ Movement	2012/13 Existing LOS (Delay) <sup>a</sup>		2017 without project LOS (Delay) <sup>a</sup>		2017 with project LOS (Delay) <sup>a</sup>	
KEY INTERSECTIONS (per Proportionate Share Impact %)								
104	108th Ave NE/NE 68th St	overall	D	38	D	44	D	46
109	NE 85th St/114th Ave NE	overall	C	22	C	32	D	37
112	Kirkland Way/6th St S	overall	D	34	F	102	F B	143 16 <sup>g</sup>
406	NE 70th St/132 <sup>nd</sup> Ave NE	overall	D	39	D	43	D	44
407	NE 70th St/116th Ave NE	overall	D	40	D	46	D	47
411	NE 72nd Pl/I-405 SB Ramp	overall	B	15	C	20+	C	22
LOCAL AREA INTERSECTIONS								
1001	6 <sup>th</sup> St S/North Driveway <sup>c</sup>	EBL/EBR	B	14	C	16	C	16
		NBL	A	8	A	8	A	8
1002	6 <sup>th</sup> St S/South Driveway <sup>c</sup>	EBL/EBR	B	12	B	13	B	15-
		NBL	A	8	A	8	A	8
1003	6 <sup>th</sup> St S/5 <sup>th</sup> Pl S <sup>c,d</sup>	EBL/EBR	B	14	C	16	C	24
		NBL	A	8	A	8	A	8
1004	6 <sup>th</sup> St S/9 <sup>th</sup> Ave S <sup>e</sup>	WBL/WBR	D	31	F	54	F C	71 24 <sup>h</sup>
		SBL	A	10	B	11	B	11
1005	6 <sup>th</sup> St S/5 <sup>th</sup> Ave S <sup>f</sup>	EB	C	19	C	24	C	25-
		WB	C	18	C	22	C	22
		NB	A	1	A	1	A	1
		SB	A	1	A	1	A	1
1006	6 <sup>th</sup> St S/Kirkland Ave <sup>f</sup>	EB	B	12	B	14	B	15-
		WB	D	30	E	44	F	55
		NB	A	2	A	2	A	2
		SB	A	1	A	1	A	1

- a Delay is represented in seconds per vehicle, all delay has been rounded to the nearest second. See Table 9 for thresholds. Any delay just over the LOS threshold is noted with a "+".
- b Intersections 104, 109, 406, 407 and 411 are signalized. Intersection 112 is an all-way stop. Intersections 1001, 1002, 1003, 1004, 1005, and 1006 are side street stop control (main line is 6<sup>th</sup> St S, northbound-southbound).
- c Intersections 1001, 1002 and 1003 are tee-intersections with stop control for the EB approach. At 1001 and 1002, there are short separate left and right turn pockets. 1001 and 1002 also assume 1 vehicle storage in center turn lane.
- d There is a short eastbound left turn center refuge area and the analysis considers 1 vehicle storage, functioning similar to a two-way left-turn lane. Even though not striped, there is adequate storage for a northbound left turn pocket, also assumed in the analysis.
- e Intersection 1004 is a tee-intersection with stop control for the WB approach. There is no center refuge area on the south leg.
- f Intersections 1005 and 1006 are four-way intersections with stop control for the east and west legs. The west leg of 1005 is a driveway.
- g with signal (no lane additions)
- h with extension of two-way left-turn lane south to NE 68<sup>th</sup> St

A discussion of the level of service results at each intersection are discussed below.

- 108<sup>th</sup> Ave NE (aka 6<sup>th</sup> St)/NE 68<sup>th</sup> St intersection (#104). This is a signalized intersection with protected left turn phases all approaches, right turn phase overlaps and pedestrian crosswalks all legs. The intersection overall is estimated to operate at LOS D for current conditions and for future conditions with or without the project for either commute peak hour. The LOS for specific movements can be higher or lower than the average for all movements. The overall average delay is estimated to 39 seconds per vehicle (s/v) for future with project in the AM peak hour and 46 s/v for future with project in the PM peak hour. In the PM peak hour, with the addition of the project traffic the overall delay is estimated to increase 2 seconds per vehicle, the delay increase for the AM condition was measured to be an insignificant increase. The project's proportional share is 5.4%.

The southbound queue was observed to extend up to and sometimes just past the south Google driveway. This occurred in both the AM and PM peak hours. The computer modeling analysis confirms and replicates this scenario. The southbound queue will restrict side street left turns from 9<sup>th</sup> Ave S. The southbound queue for the most part dissipated with each signal cycle and vehicles from 9<sup>th</sup> Ave S were able to turn left onto 6<sup>th</sup> St S. Often times, motorists on 6<sup>th</sup> St S would allow a courtesy gap ("wave-in") for motorists from 9<sup>th</sup> Ave S. This unfortunately is not replicable with the software. Gaps in traffic are essentially non-existing during peak times due to the downstream signal at NE 68<sup>th</sup> St and the queue that extends north past 9<sup>th</sup> Ave S, and it would be ineffective to conduct any gap study. To lessen the southbound queue on 6<sup>th</sup> St S, it is recommended that the southbound left turn pocket at NE 68<sup>th</sup> St be extended north and transition into a two-way left turn lane and match the channelization north of 9<sup>th</sup> Ave S. This recommended mitigation is also discussed for the 6<sup>th</sup> St S/9<sup>th</sup> Ave S and is also applicable to correcting the deficiency at that intersection (#1004).

- NE 85<sup>th</sup> St/114<sup>th</sup> Ave NE (#109). This is a signalized intersection. It is estimated to operate at LOS C for AM and PM peak hour current conditions, as well as for future conditions without the project. For 2017 AM and PM peak hours conditions with the project, the level of service is estimated to be LOS C for the AM peak hour and LOS D for the PM peak hour. The overall delay increase at this intersection with from project traffic is 5 seconds per vehicle for the PM case. For the AM peak period with project, the overall delay increase is an insignificant change. The project's proportional share is 2.7%.
- Kirkland Way/6<sup>th</sup> St S (#112). This intersection is currently an all-way stop with single lane approaches for eastbound, westbound, and northbound, and a two-lane approach (left turn pocket) for the southbound approach. The intersection is estimated to operate at LOS C and D for current AM and PM conditions respectively. A long queue was observed for the northbound approach that can often times extend well past the Kirkland Ave intersection. For future without project conditions, the

intersection is estimated to operate at LOS E and F for the AM and PM peak hours respectively. For future conditions with the project, the LOS is F for both peak hours. The estimated overall average delay for the future with project LOS F condition is 60 seconds per vehicle for the AM peak and 143 seconds per vehicle for the PM peak. The overall delay increase with project traffic is 24 s/v and 41 s/v for AM and PM peak hours respectively. The project's proportional share is 4.1%.

It should be noted that there is a large amount of background traffic forecasted to hit this intersection. The amount is 245 trips in the AM peak hour, which represents a 24% increase in traffic, or about 4% per year. The Google Phase 2 AM project trips amount to an additional 102 trips (+8%) on top of the future background forecast. The future background amount in the PM peak hour is 397 trips, which represents a 32% increase in traffic, or about 6% per year. The Google Phase 2 project trips amount to an additional 91 trips (+6%) on top of the future background forecast.

The City has recognized the need for an intersection improvement at this location, however, it is an unfunded transportation project at this time. With a signal, the 2017 peak hour level of service with project is estimated to improve to LOS B for both the AM and PM peak hour scenarios. This analysis assumes no channelization modification to the south leg. On consideration was to add a northbound left turn pocket, however, the curb radius of the southwest corner is tight and the eastbound right turn movement includes a significant amount of buses, and these buses require a large swing radius to make the right turn movement.

A signal is recommended to correct the level of service deficiency.

- NE 70<sup>th</sup> St/132<sup>nd</sup> Ave NE (#406). This intersection is signalized. It is estimated to operate at LOS D for all cases during the PM peak hour. For the AM peak hour, the intersection is estimated to operate at LOS B for existing conditions and LOS C for future conditions. The project's proportional share is 1.3%. Therefore, no mitigation is recommended, nor warranted.
- NE 70<sup>th</sup> St/116<sup>th</sup> Ave NE (#407). This intersection is signalized. It is estimated to operate at LOS D for all cases during the PM peak hour. For the AM peak hour, the intersection is estimated to operate at LOS D for existing and future without project, and LOS E for future with project. The average delay increase for the AM peak with the project is about 5 seconds per vehicle. Improvements would be required at this intersection if the project's proportional share is greater than 15%, which is the standard for LOS E conditions. The project's proportional share is 2.7%. Therefore no mitigation is warranted.
- NE 72<sup>nd</sup> Pl/I-405 SB Ramps (#411). This intersection is signalized. It is estimated to operate at LOS B for existing conditions and LOS B and C for future conditions, AM and PM peak respectively, with or without the project. The analysis assumes the

southbound off-ramp as a two lane approach with an exclusive left and right turn lane even though it is not striped as such, although it is wide enough to accommodate it. The project's proportional share is 2.6%. Improvements are not required where the LOS is A thru D. Therefore, no mitigation is recommended.

- 6<sup>th</sup> St S/North Google Driveway (#1001). This driveway is a 30-ft wide 3-lane driveway with 2 exit lanes. The storage distance for the exit lanes are very short, the analysis assumes a short 25-ft right turn pocket. The left turn out analysis assumes 1-vehicle storage in the center turn lane for refuge as part of the eastbound to northbound left turn movement. The level of service summary reported in Table 10a and 10b reflect the approach as a whole. The eastbound approach is estimated to operate at LOS B for current AM and PM conditions, and LOS B and C respectively for AM and PM future conditions, with or without the project. As noted earlier, it is estimated that no significant amount of Phase 2 traffic will use this driveway. Also, it is estimated that only a small amount of traffic from Phase 2 will pass by this driveway.
- 6<sup>th</sup> St S/South Google Driveway (#1002). This driveway is also a 30-ft wide 3-lane driveway with 2 exit lanes. The storage distance for the exit lanes are very short, the analysis assumes a 25-ft right turn pocket. The left turn out analysis assumes a 1-vehicle storage in the center two-way left-turn lane for refuge as part of the eastbound to northbound left turn movement. The level of service summary reported in Table 10a and 10b reflect the driveway approach as a whole (for both right and left movement). The eastbound approach is estimated to operate at LOS B for all AM and PM conditions, existing and future, with and without the project. According to existing driveway counts, the existing two-way volume on this driveway is 111 in the AM peak hour and 117 in the PM peak hour. The Phase 2 project is estimated to add 120 vph in the AM peak and 103 vph in the PM peak, thus, in effect doubling the volume at this driveway. On average, for either the AM or PM peak hour with project, the traffic volume headway is about 18 seconds per vehicle in the peak direction. It is estimated that approximately 90% of the project traffic will be to and from the south via 6<sup>th</sup> St S. Queue spill back (southbound queue on 6<sup>th</sup> St S) from the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St intersection is estimated to extend north past this driveway during peak times during the signal red phases at 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St. During stopped queue conditions, it is estimated that motorists on 6<sup>th</sup> St S will wave-in motorists exiting from the Google driveway. Mitigation recommendations noted above that would include restriping of the section of 6<sup>th</sup> St S from 9<sup>th</sup> Ave S to NE 68<sup>th</sup> St is estimated to reduce southbound queuing. This was discussed above with #104 and below as part of #1004. No mitigation is recommended at this driveway.
- 6<sup>th</sup> St S/5<sup>th</sup> Pl S (#1003). This intersection is stop control for the eastbound approach. The eastbound approach is slightly skewed with an acute angle to 6<sup>th</sup> St S. There is a center storage/acceleration lane on the north leg to facilitate the eastbound left turn from 5<sup>th</sup> Pl S. The analysis assumes a 1-car storage in the northbound

acceleration/storage lane on 6<sup>th</sup> St S just north of the intersection. For AM peak hour conditions, the eastbound approach is estimated to operate at LOS B for existing and future conditions without project and LOS C for conditions with project; albeit only a 1 to 2 second increase from future background conditions. For the PM peak hour conditions, the eastbound approach is estimated to operate at LOS B for existing conditions and LOS C for future conditions. The delay increase with project is 8 seconds/vehicle. No mitigation is recommended.

It is estimated that the majority of Phase 2 traffic to and from the north will use 5<sup>th</sup> Pl S to access 6<sup>th</sup> St S. Access to 5<sup>th</sup> Pl S will be via a new connection at the 5<sup>th</sup> Pl S/7<sup>th</sup> Ave S intersection. The recommended design of this intersection will restrict left turns out of the site as well as restrict right turns in. The ultimate goal is to prevent any traffic from Google to use 7<sup>th</sup> Ave S to access the Phase 2 Google site. A conceptual sketch of this recommended intersection design is included in the mitigation section.

- 6<sup>th</sup> St S/9<sup>th</sup> Ave S (#1004). This intersection is stop control for the westbound approach, and there are a few low volume driveways on the west side. The estimated level of service for the westbound approach for the AM peak hour is LOS C for existing and future conditions without the project, and LOS D for future conditions with the project. The sidestreet average delay is estimated to increase from 21 seconds per vehicle for existing to 35 seconds per vehicle in the future with Google Phase 2 traffic. For the PM peak hour, the westbound approach level of service is LOS D for existing conditions and LOS F for future conditions with or without the project. The estimated average delay for existing PM conditions is 31 seconds per vehicle, estimated to increase to 54 seconds/vehicle for future without project, and 71 seconds per vehicle with project.

As noted in the Intersection #104 discussion, the southbound queue on 6<sup>th</sup> St S to NE 68<sup>th</sup> St was observed to extend up to and sometimes past the south Google driveway. This occurred in both the AM and PM peak hours. The computer modeling analysis confirms and replicates this scenario. The southbound queue will restrict left turn access from 9<sup>th</sup> Ave S. It was observed that the southbound queue for the most part dissipated with each signal cycle and vehicles from 9<sup>th</sup> Ave S were able to turn left onto 6<sup>th</sup> St S. Often times, motorists on 6<sup>th</sup> St S would allow a courtesy gap (“wave-in”) for motorists from 9<sup>th</sup> Ave S. This unfortunately is not replicable with the software. Gaps in traffic are essentially non-existent during peak times due to the downstream signal at NE 68<sup>th</sup> St and the queue that extends north past 9<sup>th</sup> Ave S, and it would be ineffective to conduct any such gap study. To lessen the southbound queue on 6<sup>th</sup> St S, it is recommended that the southbound left turn pocket be extended north and transition into a two-way left turn lane and match the channelization north of 9<sup>th</sup> Ave S. If this mitigation recommendation is not effective at improving 9<sup>th</sup> Ave S access to 6<sup>th</sup> St S, installation of a signal at this intersection is recommended as a follow-up improvement.

With the restriping recommended improvement (no signal), the LOS and delay are estimated to improve significantly per the modeled analysis for 9<sup>th</sup> Ave S access. Assuming a 1-vehicle storage in the proposed center two-way left-turn lane for the left turn from 9<sup>th</sup> Ave S, the level of service and delay are estimated to be LOS C at 19 sec/veh for the AM peak hour and LOS C at 24 sec/veh for the PM peak hour. These results are a significant improvement over existing conditions (as well as future background conditions). Furthermore, with the recommended rechannelization, it would improve sight line visibility (for all times of the day) as a result of removal of all on-street parking, hence provide safer conditions for access as well as pedestrian visibility. In addition, by removing on-street parking on 6<sup>th</sup> St, it would eliminate back-in parallel parking maneuvers that can cause delay for mainline traffic.

As a side note, discussed later as well, it was observed that a fair amount of vehicles parked on either 9<sup>th</sup> Ave S or 6<sup>th</sup> St S (south of 9<sup>th</sup> Ave S) and walked to the adjacent bus stop, and vice-versa. The accident investigation (see Table 3 and #1004 discussion) indicates there are a few accidents per year on 6<sup>th</sup> St S between NE 68<sup>th</sup> St and 9<sup>th</sup> Ave S as a result of parallel on-street parking conditions.

- 6<sup>th</sup> St S/5<sup>th</sup> Ave S (#1005). This intersection is stop control for the westbound approach, and there is a commercial driveway on the west side. 6<sup>th</sup> St S in this vicinity is a 2-lane roadway with bike lanes and parallel on-street parking. The estimated level of service for the westbound approach for the AM peak hour is LOS C for all cases, and LOS C for all cases for the eastbound driveway approach. The estimated increase in delay is calculated to be insignificant. The estimated level of service for the PM peak hour is LOS C for all cases for both side street approaches.

Extension of the two-way left turn lane north from the Google campus to 5<sup>th</sup> Pl S would assist vehicles exiting from side streets and driveways. In this case 5<sup>th</sup> Ave S is the only side-street in this section, however, there are a fair amount of driveways. The level of service as calculated indicates no significant delay for side street approaches, thus the center turn lane concept would not be required to mitigate LOS deficiencies for this section. Comfortable access from 5<sup>th</sup> Ave S, and likely other driveways in the two-lane section of 6<sup>th</sup> St S, can be restricted by on-street parking. Removal of on-street parking would provide longer sight lines for side-street entering motorists thus improving safety. Nevertheless, on-street parking is often a desired use for all commercial properties fronting 6<sup>th</sup> St S. For safety improvement at the 5<sup>th</sup> Ave S side-street, at a minimum it is recommended that approximately 50' of on-street parking east side of 6<sup>th</sup> St S to the south be removed to extend sight lines south.

It was observed that some of the traffic on 5<sup>th</sup> Ave S was as a result of persons parking their car on 5<sup>th</sup> Ave S and walking to the adjacent bus stop, and versa-versa.

- 6<sup>th</sup> St S/Kirkland Ave (#1006). This intersection is a four-way intersection with stop control for the eastbound and westbound approaches. 6<sup>th</sup> St S in this vicinity is a 2-lane roadway with bike lanes and some parallel on-street parking. For the AM peak hour, the estimated level of service for the westbound approach is LOS D for existing, E for future without project, and F for future with project. The level of service for the eastbound approach is LOS B for all cases. The same conclusions are true for the PM peak hour. The estimated delay for the westbound approach for the future with project scenario is 64 seconds/vehicle in the AM and 55 seconds/vehicle in the PM.

As discussed above, a signal is recommended at the 6<sup>th</sup> St S/Kirkland Way intersection, which is just north of this intersection. For future conditions, a signal at 6<sup>th</sup> St S/Kirkland Way will significantly reduce the northbound queue on 6<sup>th</sup> St S, however the queue is estimated to still extend past Kirkland Ave. With a signal in lieu of an all-way stop, the queue will be stop-then-go rather than a rolling queue. This is not a significant difference but nevertheless it is assumed that mainline motorists would be more easily inclined to permit access from the side street.

Observations at this intersection show a heavy westbound left turn in the AM and a northbound queue on 6<sup>th</sup> St S from Kirkland Way that extends past Kirkland Ave. During congested times, vehicles traveling north on 6<sup>th</sup> St S often leave a gap at the Kirkland Ave intersection with the intent to allow side street left turn and thru movements to enter. This is a human courtesy factor typically referred to as a “wave-in” movement whereby the major street motorist permissively yields the right-of-way to the side street motorists. It is something not reflected in the capacity calculations. Thus the delays reported are assumed to be a worst-case scenario.

All of the level of service worksheets are included in the Appendix.

## **IX. Site Access**

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### **A. Site Access Circulation**

The site (Phase 2) will be served by a continuous access road that circulates around the south, west and north end of the building. Access to the parking garage P1 level will be at the north and south ends of the garage. Access to the P2 level will be from two driveways to the west end of the access road.

At the north end the access road will connect at the 7<sup>th</sup> Ave S corner junction with 5<sup>th</sup> Pl S. There is also proposed an emergency connection to 7<sup>th</sup> Ave S at the west end of the site. The proposed access intersection design to 5<sup>th</sup> Pl S will be such that no project traffic will be able to use 7<sup>th</sup> Ave S, either entering or exiting the site. Thus, the ultimate

design would prevent right turns from the west from entering the site and prevent left turns to the west exiting the site.

At the south end the access road will connect to the south end of the existing campus with ultimate access to 6<sup>th</sup> St S via the existing south driveway. This access connection from the proposed site to the existing campus will cross the abandoned railroad/future community trail that separates the existing campus and the proposed campus. The current design of the access road crossing is in negotiations with the City.

Pedestrian connectivity between the two parcels will include a pedestrian overpass over the abandoned railroad/future community trail corridor.

## **B. Neighborhood Impacts**

There are several residential areas in the area that have potential to be impacted by traffic associated with the project. Residential roadways considered as part of this study include 5<sup>th</sup> Ave S, 7<sup>th</sup> Ave S, 7<sup>th</sup> St S, 8<sup>th</sup> St S, 9<sup>th</sup> Ave S, and Kirkland Ave.

5<sup>th</sup> Ave S and 7<sup>th</sup> St S are two local access streets just east of the existing Google campus. These two roadways connect to essentially serve as a single roadway for the area. The roadway primarily serves residential properties but also one commercial property at the west end of 5<sup>th</sup> Ave S. The roadway has access to 6<sup>th</sup> St S and to 9<sup>th</sup> Ave S. There is signage at the west end of 5<sup>th</sup> Ave S denoting local access only. If southbound queuing on 6<sup>th</sup> St S is significant (from NE 68<sup>th</sup> St), there is the potential for residents of the local area east of 6<sup>th</sup> St S to divert to 5<sup>th</sup> Ave S and 7<sup>th</sup> St S to by-pass using the 6<sup>th</sup> St S/9<sup>th</sup> Ave S intersection (southbound left turn). It is assumed that no Google traffic from either the existing Phase or Phase 2 would use this route. It is estimated that with improvements on 6<sup>th</sup> St S between 9<sup>th</sup> Ave S and NE 68<sup>th</sup> St, the southbound queue will be reduced thereby reducing the diversion potential on 7<sup>th</sup> St S.

7<sup>th</sup> Ave S fronts the north end of the site. All of the properties fronting this roadway are residential to the west. The parcel is restricted through title agreements that none of the traffic associated with the project will use 7<sup>th</sup> Ave S, either entering or exiting. The project is proposing an access to the intersection junction of 7<sup>th</sup> Ave S and 5<sup>th</sup> Pl S. The intersection and access design will be made such that no right turns entering the site are feasible from the west and no left turns exiting to the west are permitted. It is estimated that approximately 80 trips will enter the site from the north on 5<sup>th</sup> Pl S in the morning peak and 75 trips will exit the site to the north on 5<sup>th</sup> Pl S in the evening peak. As with most office type development, there will be minimal traffic in the non-commute directions and during non-peak times.

8<sup>th</sup> St S (and 9<sup>th</sup> Ave S) have the potential for neighborhood cut-through traffic for future trips between NE 85<sup>th</sup> St and I-405 at the north end and 6<sup>th</sup> St S and NE 68<sup>th</sup> St at the south end. For northbound travel, the future level of service estimate at the Kirkland

Way/6<sup>th</sup> St S is LOS F with the existing all-way stop control. This has the potential to divert project traffic (as well as other traffic) to use 8<sup>th</sup> St S and 9<sup>th</sup> Ave S with ultimate access to/from 6<sup>th</sup> St S. With installation of a signal at the Kirkland Way/6<sup>th</sup> St S intersection, the future level of service is estimated to be LOS B thus the diversion potential to 8<sup>th</sup> St S would be significantly mitigated by reducing delays at that intersection (both AM and PM) thereby minimizing the cut-through attraction. Currently, there are four speed bumps on 8<sup>th</sup> St S (pasted warning signs 15 mph) to minimize the cut through traffic and keep speeds down. Recent observations of AM and PM peak hour traffic movements at the 6<sup>th</sup> St S/9<sup>th</sup> Ave S intersection indicate there are no trips that enter the Google campus from 9<sup>th</sup> Ave S, and versa-versa. A license plate study could be conducted for both peak periods to evaluate the actual number of cut-through trips occurring today. It is estimated that no Google traffic from Phase 2 would use this route for cut-through.

### **C. Driveway Queuing**

The estimate of traffic exiting the two existing Google driveways during the PM peak hour (with Phase 2) is 88 vehicles at the north driveway and just over 200 at the south driveway. The vast majority of vehicles at the south driveway (87%) are estimated to exit to the south (right turn out).

As discussed above in Section VIII for intersection #104 and #1004, the simulation modeling of 2017 AM and PM peak hour conditions with the project for the segment of 6<sup>th</sup> St S between NE 68<sup>th</sup> St and Kirkland Way was conducted using Trafficware's SimTraffic software. The results indicate there would be southbound queues extending back (north) from the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St intersection during PM peak hour conditions, as well as AM conditions. The queues observed for the existing conditions were observed to extend at times back through 9<sup>th</sup> Ave and past the south driveway. The maximum queues with simulation were estimated to extend beyond the south driveway. This will have a direct impact on the exiting movements at the Google south driveway.

It is likely that some of the Google traffic (primarily from the existing campus and garage) will shift to the north driveway to exit south on 6<sup>th</sup> St S as a result of the estimated increased queue congestion that would occur at the south driveway with addition of the new traffic. This in turn is estimated to have a slight negative affect on the level of service at the north driveway, but should improve slightly the level of service at the south driveway. However, the LOS grades as shown in Table 10a and 10b are estimated to remain unchanged with the minor potential shift in existing Google traffic.

#### **D. Signal Warrants at South Driveway**

The south driveway to 6<sup>th</sup> St S is estimated to be the driveway with the majority of traffic serving both the existing campus as well as Phase 2. The north driveway is estimated to remain relatively unchanged aside from some expected shifts of existing site traffic from the south driveway to the north driveway with added congestion at the south driveway. Traffic associated with the Phase 2 building to and from north will use 5<sup>th</sup> Pl S to 6<sup>th</sup> St S thus the existing north driveway should not see any significant traffic from the proposed project.

Therefore, a signal warrant check was conducted only at the existing southerly driveway. The signal warrant analysis was conducted per MUTCD guidelines for Warrants 1A, 1B, 2, and 3. The warrant requires hourly volumes for the major street (6<sup>th</sup> St S) as well as hourly volumes for the minor street (south driveway).

The hourly volume on 6<sup>th</sup> St S was obtained from the City. This count was conducted north of NE 68<sup>th</sup> St and is an average of a two-day count conducted Tuesday July 12, 2011 and Wednesday July 13, 2011. Volumes were recorded by direction however for the signal warrant analysis, only the total volume both directions is needed. The count was adjusted to 2017 using a 1% per year growth rate.

24-hour counts (3 day average, Tuesday thru Thursday) were conducted at both of the existing driveways. The exiting volume at the south driveway was used for this warrant analysis. A daily estimate by hour of day of Phase 2 traffic using this driveway was made based on the hourly percentages for the existing campus traffic exiting the driveway.

The results of the warrant analysis are tabulated below in Table 11. A summary of the warrant calculations are attached in the appendix.

**Table 11**  
**Signal Warrant Analysis Summary (Google South Site Access)**

Warrant #	Description	Warrant Met?	Comment
1A	Minimum Vehicular Volume	No <sup>a</sup>	See appendix for results
1B	Interruption of Continuous Traffic	No <sup>b</sup>	See appendix for results
1A & 1B	Reduced 1A and 1B conditions	No/No <sup>c</sup>	both conditions must be satisfied at a 20% reduced threshold level.
2	Four Hour Volume Warrant	No <sup>d</sup>	See appendix for results
3	Peak Hour Volume Warrant	Yes <sup>e</sup>	See appendix for results

a threshold volume for side street is 150 vph. There are only 2 of 8 instances where the warrant is met.

b threshold volume for side street is 75 vph. There are only 3 of 8 instances where the warrant is met.

c threshold volume for side street is 120 vph for 1A and 60 vph for 1B. There are only 2 of 8 instances where the warrant is met for 1A and 4 of 8 for 1B.

d threshold volume for side street dependant on major street. In this case, there are 2 of 4 hours that are met.

e threshold volume for side street in this instance is 145 vph. The estimated peak hour volume estimated to be 186 vph. However, approximately 85% of this volume is right turn.

As shown in Table 11, given the traffic volume forecasts, none of the major volume signal warrants are met. Warrant 3 is a special circumstance warrant condition primarily for land uses with high peaking conditions, office park would be one consideration. However, approximately 85% of the right turn volume is right turn exiting.

Signal Warrant #1 is the Eighth-Hour Vehicular Volume Warrant. It consists of three 'sub-warrants' where meeting one of these would satisfy the condition of Warrant 1; Condition A, Condition B, and 80% level for Condition A and B where both conditions must be met to meet this sub-warrant. Assuming a dual lane approach on the major street and a single lane approach on the side street, none of the sub-warrants are met. The three sub-warrants are discussed below:

- For Warrant 1A, it requires that for any 8 hours of a given day, the major street volume shall be equal to or exceed 500 vehicles per hour (vph) both directions and the side street volume shall equal or exceed 150 vph for those same 8 hours. There are only two hours that meet this criteria.
- Warrant 1B requires that for any 8 hours of a given day, the major street volume shall be equal to or exceed 900 vph both directions and the side street volume shall equal or exceed 75 vph for those same 8 hours. There are only 3 hours that meet this criteria.
- Combination of Warrant 1A and 1B. This combination considers Warrant 1 met if both warrant criteria of 1A and 1B are met at the 80% level. There are 2 hours that meet the Warrant 1A criteria and 4 hours that meet the 1B criteria. Therefore, this combination of warrants is not met.

Signal Warrant #2 is the Four-Hour Vehicular Volume Warrant. It requires that for any 4 non-consecutive hours of a given day, the major street volume and the minor street

volume shall fall above the curve threshold. Threshold volume criteria for the minor street vary based on the major street volume. The lowest threshold for the minor street is 80 vehicles. There are two hours that meet or exceed this lower threshold volume, thus this warrant is not met. The fourth highest hourly volume is estimated to be 46 vph.

Signal Warrant #3 is the Peak-Hour Vehicular Volume Warrant. There are two different conditions that if satisfied would meet this warrant.

- Condition A includes three parts and all must be met: 1) the total stopped delay equals or exceeds 4 vehicle-hours for a one-lane approach, 2) the volume on the minor-street exceeds 100 vph for a one lane approach, and 3) the total entering volume during the hour equals or exceeds 650 vph for intersections with 3 approaches.

For Part 1, the estimated total delay for the PM peak hour (critical peak) is approximately 0.73 vehicle hours thus #1 is not met. The delay is based on Synchro results.

Part 2 is met since the peak hourly approach volume is 200 vph (PM peak hour). And Part 3 is met, since the total entering volume is estimated to be 1,350 vph (PM peak hour). In any case, only 2 of the 3 parts are met, thus Condition A is not met.

- Condition B requires that for any 1 hour of a given day, the major street volume and the minor street volume shall fall above the curve threshold. The threshold for the minor street is 145 vehicles given a major street forecast of 1,215 vph. There side street approach volume is just over 200 vph, thus this warrant could be considered as met.

It should be noted that the MUTCD guidelines suggest utilizing engineering judgment for any minor street right-turn volume reductions. Since the approach is estimated to be a single lane approach, it was concluded that leaving the right turn volumes in would be appropriate. However, the vast majority of the exiting movement is right turn out (87%) and the delay at the driveway is created more so by the queue spill back from NE 68<sup>th</sup> St rather than any difficulty in vehicles exiting the driveway. The left turn out movement can make efficient use of the center two way left turn lane. It is expected that in real world situations, vehicles southbound on 6<sup>th</sup> St S moving in a slow queue would permit alternating entry for the right turn exiting the driveway.

## **X. Parking**

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### **A. On-Site Parking**

The total proposed parking for Phase 2 is 746 stalls. All of these stalls would be covered parking in a two level parking garage. This equates to a parking ratio of 1 stall per 241 gross square feet, assuming 180,000 gross square feet.

According to ITE Parking Generation, 4<sup>th</sup> Edition, the peak weekday parking demand for general office in a suburban setting is expressed by the equation:  $P=2.51(X)+26$ ;  $R^2=0.91$ , where P equals occupied parking stalls and X equals gross floor area (kgsf). Utilizing this equation, it is estimated that the peak parking demand will be 478 stalls. This suggests the proposed project will not be under parked. The peak demand is estimated to occur between the hours of 10:00 AM and noon. The demand is estimated to be no less than 80% of peak period for the remaining hours between 8:00 AM and 4:00 PM. The demand drops significantly outside these hours.

The existing parking supply for Phase 1 is 631 stalls. The gross floor area is 194,825 gsf. Thus the parking supply is 1 stall per 309 gsf floor area. The parking supply consists of the following: 514 unmarked stalls (general use), 53 HOV stalls, 13 handicap stalls, 4 expected mother stalls, 6 electric car stalls, 19 low emission vehicle stalls, 16 visitor stalls, and 6 vendor stalls. There are 449 stalls in the garage and 182 surface stalls. The estimated demand per the ITE equation is 515 vehicles, which is 116 fewer than supply.

As part of traffic counts conducted in October 2012, TDG also recorded the parking demand Wednesday 10/10/12 at 10:15 am. The demand was observed to be 373 vehicles, and 18 motorcycles. The demand per this count is 62% of supply. No employees were observed during the AM traffic counts to park off-site and walk to the site. Likewise, no employees were observed during the PM traffic counts to walk off site to parked vehicles off site.

The total parking provided with Phase 1 and 2 will be 1,377 stalls. The estimated total demand is 993 vehicles. Therefore, the parking supply as proposed is estimated to be adequate. The estimated demand is approximately 72% of supply.

### **B. Off-Site Parking**

The off-site parking area of focus includes 6<sup>th</sup> St S, 5<sup>th</sup> Ave S, 5<sup>th</sup> Pl S, and 9<sup>th</sup> Ave S. On-street parking is not permitted on 5<sup>th</sup> Pl S. For the other roadways, there are no parking sign duration restrictions. On-street parking is available on 6<sup>th</sup> St S south of 9<sup>th</sup> Ave S and north of the Google campus, on 9<sup>th</sup> Ave S both sides between 6<sup>th</sup> St S and 7<sup>th</sup> St S and on the south side east to 8<sup>th</sup> St S. Parking is permitted on a small area on the north side of 5<sup>th</sup> Ave S.

As noted above, it was observed during peak period counts that no Google employees park off-site and walk to the campus.

There is however a high demand for parking on these streets. A detailed parking demand analysis was not conducted however it is estimated through observations that a large portion of the current on-street parking is from transit riders. This parking demand is likely to lessen with the completion of the South Kirkland Park and Ride. If long term parking is filling up supply on the 5<sup>th</sup> Ave S and 9<sup>th</sup> Ave S, parking signage may be needed, such as 2-hr or 4-hr duration 7am thru 6pm Monday through Friday, to shift parking for transit to the park and ride facilities.

## **XI. Transportation Demand Management Plan (TDM)**

The transportation demand management (TDM) plan goal is to help achieve mode split goals by reducing the single occupant vehicle (SOV) percentage of office trips from the project thereby reducing the overall SOV travel to and from the site.

The following are examples of TDM strategies:

- **Provide a Commuter Information Center (CIC):** A CIC would be located in a prominent location, typically in the lobby of the building. A CIC is a transportation information display in a freestanding, wall mounted, or kiosk configuration, which provides rideshare and transit service information including a destination brochure, targeted specifically to the commuter market. Preferred location will be determined by the BTC.
- **Designate a Building Transportation Coordinator (BTC):** The BTC would be appointed (identified by name and position) by the building or institution owner(s) and/or responsible party(s) prior to issuance of the Certificate of Occupancy. The BTC will be responsible for accomplishing program goals, and will maintain and stock the Commuter Information center. The BTC will be located on the site, available to the building's tenants, and be part of Building Management. The BTC's name, phone number and location will be displayed on the building's directories.
- **Periodic Promotional Events:** A minimum of one promotional event per year is recommended to promote transit and high occupancy vehicle (HOV) use and flextime programs for employees and/or tenants.
- **Ridematch Opportunities:** Depending on the success of the TMP, a ridematch program may be implemented. Ridematch is a Metro's computer-assisted service which matches commuting customers with similar origins, destinations, and work schedules for purposes of forming, joining, or adding to carpools, vanpools, and custom buses.

- **Preferential Parking for HOV's:** Preferential parking could be provided at the building near employee entrances for carpools/vanpools. Preferential parking for HOV's could be provided at a rate of 5% of total office parking stalls. These spaces will be designated specifically for carpools and will have high visibility to encourage program participation. The carpool/vanpool should commute at least four days per week to and from work. These spaces will be reserved for exclusive use by carpools/vanpools between the hours of 7:00 and 10:00 AM. Carpool/Vanpool spaces will be clearly identified with signs and located near the elevator lobby.
- **Incentives for Carpool/Vanpool:** A two-person carpool would receive a 25% discount from the normal monthly parking rate and a three person or larger carpool/vanpool would receive a 50% discount.
- **Transit Subsidy:** A peak hour transit subsidy of 50% could be offered to employees that primarily commute to and from work by bus.
- **Signage:** Signage could be provided in the parking lot giving preferential treatment for carpools and vanpools.
- **Bicycle Racks -** Provide weather protected lockable bicycle racks and/or hangers to be used by employees and/or visitors.
- **Showers/Dressing Rooms:** Project should provide both Men and Women's showers and dressing rooms which can be utilized for those walking or bicycling to work.

The existing Phase 1 project had implemented some of these strategies to help reduce SOV trips and reduce commute trips overall. It is recommended that Phase 2 implement these strategies and reconnect with Phase 1 to develop effective TDM elements for the entire site to help reduce SOV use.

## **XII. Summary**

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Google Phase 2 Office Complex is a proposed 180,000 gsf office park development located south of 7<sup>th</sup> Ave S and west of the existing Google Campus, which will compliment the existing campus. The site is located on the west side of the abandoned railroad tracks/future community trail, which separates the two Google sites.

The following are the summaries of this traffic study.

### **A. Trip Generation, Trip Distribution & Assignment**

The Phase 2 Google Office Building is estimated to generate a total of 1,684 daily, 207 AM and 180 PM peak hour trips to and from the site. The site is currently vacant thus there is no trip credit for existing uses to be removed.

The assignment of trips was divided approximately even with trips north and south of the site. As part of the Traffic Concurrency process, the City's traffic model identified the project's PM trip assignment, which was also based on the existing driveway patterns for the existing campus. All of the project trips are expected to use 6<sup>th</sup> St S for access to and from the site. The trips to and from the north are estimated to use 5<sup>th</sup> Pl S via the internal roadway on north end of the site for access to 6<sup>th</sup> St S, and trips to and from the south are estimated to use the existing south Google driveway via the internal roadway on the south end of the proposed site. A small amount of trips to and from the north such as guest and vendor trips were assumed to use the existing south Google driveway in lieu of 5<sup>th</sup> Pl S. No trips for Phase 2 are anticipated to use the existing north Google driveway.

In general with most office parks, the split of traffic entering and exiting the site during the morning period is typically 90% entering. Similarly for the afternoon/evening period, the split of traffic entering and exiting the site is typically 90% exiting. It should be noted that Google traffic and employee pattern suggest that most Google employees arrive slightly later in the morning period than typical street peaks and leave slightly later than the afternoon/evening peaks. Given the large amount of employee amenities on site, it is expected that most employees stay on site during breaks and lunch periods.

### **B. Concurrency, Significant Intersections**

Based on the City's concurrency test results, this project passed concurrency. There are six intersections defined as significant impact based on the City's proportional share impact calculations worksheet. These intersections include:

- 108th Ave NE/NE 68th St (#104); Proportional Share = 5.4%
- NE 85th St/114th Ave NE (#109); Proportional Share = 2.7%
- Kirkland Way/6th St (#112); Proportional Share = 4.1%
- NE 70th St/132<sup>nd</sup> Ave NE (#406); Proportional Share = 1.3%
- NE 70th St/116th Ave NE (#407); Proportional Share = 2.7%
- NE 72nd Pl/I-405 SB Ramp (#411); Proportional Share = 2.6%

The project's proportional share impact at each of these intersections is greater than 1% but less than 5% except for the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St intersection where the project's impact is just over 5%.

Mitigation for SEPA impacts as defined by the City of Kirkland's Traffic Impact Analysis Guidelines indicate that mitigation improvements are required at any intersection where: 1) the LOS is E and the project's proportional share impact is greater than 15%, or 2) the LOS is F and the project's proportional share impact is greater than 5%. No mitigation is required where the LOS is D or better.

### **C. Level of Service**

#### Off-Site Intersections – with Significant Impact

One intersection is estimated to operate at LOS F in the future PM peak (2017) with or without the project, as well as LOS F in the AM peak with the project. This intersection is: Kirkland Way/6th St S (#112).

Since the project's proportional share impact is less than 5% at this intersection, which is the threshold percentage for LOS F conditions, the project is not required to provide mitigation towards improving the level of service under SEPA. However, the applicant recognizes that this is a problematic LOS intersection and is willing to contribute towards intersection improvements at this location, which will improve traffic operations for the project.

The NE 70<sup>th</sup> St/116<sup>th</sup> Ave NE intersection is estimated to operate at LOS E for the AM peak hour in 2017 with the project. The project's proportional share impact at this intersection is 2.7%, which is less than threshold 15% for required mitigation improvements for LOS E conditions, thus no improvements are suggested.

The mitigation fees that will be required per City ordinance based on the project's floor area are assumed to provide assistance in the form of traffic mitigation towards the City's roadway/intersection improvement projects for the problem analysis intersections.

### Site Access Driveways (Existing Driveways (2))

Both project driveways are estimated to operate in the LOS B/C range for both AM and PM peak hours.

#### 6<sup>th</sup> St S/5<sup>th</sup> Pl S

5<sup>th</sup> Pl S will serve as the northerly access for the proposed site for access to 6<sup>th</sup> St S. The intersection is estimated to operate in the LOS B/C range for both AM and PM peak hours. The analysis assumes 1-vehicle storage in the center acceleration/refuge area on 6<sup>th</sup> St S north of the intersection for the left-turn movements from 5<sup>th</sup> Pl S.

#### 6<sup>th</sup> St S/9<sup>th</sup> Ave S

This intersection is estimated to operate at LOS D for future conditions with the project in the AM peak and LOS F for future conditions with or without the project in the PM peak. Without any roadway improvements, the southbound queue on 6<sup>th</sup> St S to NE 68<sup>th</sup> St is estimated to extend past the south Google driveway on a regular basis. The southbound queue will restrict left turn access from 9<sup>th</sup> Ave S. For peak times, the only opportunity for vehicles exiting left from 9<sup>th</sup> Ave S would be with a courtesy gap (“wave-in”) from motorists on 6<sup>th</sup> St S. To lessen the southbound queue on 6<sup>th</sup> St S, it is recommended that the southbound left turn pocket be extended north and transition into a two-way left turn lane and match the channelization north of 9<sup>th</sup> Ave S. With this recommended improvement, the LOS and delay are estimated to improve significantly. The recommending restriping will create center turn lane storage opportunities for left turns exiting from 9<sup>th</sup> Ave S. Assuming a 1-vehicle storage in the proposed center two-way left-turn lane for the left turn from 9<sup>th</sup> Ave S, the level of service and delay are estimated to be LOS C for either peak hour instance. Furthermore, with the recommended rechannelization, it would improve sight line visibility (for all times of the day) as a result of removal of all on-street parking, hence provide safer conditions for access as well as pedestrian visibility. Finally, by removing on-street parking on 6<sup>th</sup> St, it would eliminate back-in parallel parking maneuvers that can cause delay for mainline traffic.

#### 6<sup>th</sup> St S/5<sup>th</sup> Ave S

The estimated level of service for the westbound approach for the AM or PM peak hour is LOS C for future conditions. Extension of the two-way left turn lane north from the Google campus to 5<sup>th</sup> Pl S would improve side-street level of service by allowing center-lane storage for vehicles exiting from side streets and driveways. In this case 5<sup>th</sup> Ave S is the only side-street in this section, however, there are a fair amount of low-volume driveways. The level of service as calculated indicates no significant delay for side street approaches, thus the center turn lane concept would not be required to mitigate poor LOS deficiencies for this section. Comfortable access from 5<sup>th</sup> Ave S, and likely other driveways in the two-lane section of 6<sup>th</sup> St S, can be restricted by on-street parking.

Removal of on-street parking would provide longer sight lines for side-street entering motorists thus improving safety. Nevertheless, on-street parking is often a desired use for all commercial properties fronting 6<sup>th</sup> St S. For safety improvement at the 5<sup>th</sup> Ave S side-street, at a minimum it is recommended that approximately 80' of on-street parking east side of 6<sup>th</sup> St S to the south be removed to extend sight lines south.

#### 6<sup>th</sup> St S/Kirkland Ave

This intersection is estimated to operate at LOS F for AM or PM peak hour conditions with the project. The level of service pertains to the westbound approach for both peaks. The level of service for the eastbound approach is B for all cases. A signal is recommended at the 6<sup>th</sup> St S/Kirkland Way intersection. A signal at 6<sup>th</sup> St S/Kirkland Way will significantly reduce the northbound queue on 6<sup>th</sup> St S, however the queue is estimated to still extend past Kirkland Ave. With a signal in lieu of an all-way stop, the queue will be stop-and-go rather than a rolling queue. This is not a significant difference but nevertheless it is assumed that mainline motorists would be more easily inclined to permit access from the side street. A signal at 6<sup>th</sup> St S/Kirkland Way will significantly improve the level of service at that intersection thus it is estimated to provide a quicker route for westbound-to-southbound motorists.

#### **D. Driveway Queue**

It is estimated that the southbound queue at the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St intersection will extend back to the Google south driveway during peak periods. The driveway queue exiting the site, in particular during the PM peak, will thus be affected. It is estimated that with Phase 1 and Phase 2 cumulative Google traffic estimates at the south driveway, the exiting maximum queue would be 200 feet and the calculated 95<sup>th</sup> percentile queue estimated at 140 feet.

The estimated queue at the existing north driveway is estimated to be similar to current conditions.

#### **E. Signal Warrants (South Driveway)**

Several signal warrants were analyzed for vehicular volume conditions, ie., no pedestrian warrants or accident situations. The warrants included Warrant 1A, 1B, 2, and 3. The volume forecasts indicate Warrants 1A, 1B (and combination 1A/1B), and 2 are not met. Warrant 3 is a special circumstance warrant for heavy peak hour conditions. This warrant is met. However, special consideration should be given prior to installation of a signal. The predominant volume exiting the site is right turns, 87% to be exact. The estimated driveway delay is LOS C assuming no impacts from adjacent intersections. However, in this case, based on a traffic simulation test, it is estimated the southbound queue at the 108<sup>th</sup> Ave NE/NE 68<sup>th</sup> St could spill back to the south driveway thus creating congestion/blockage for vehicles exiting this driveway. If this tends to hold true, it is

likely that some of the existing campus Google employees would shift to the north driveway for exiting in the PM peak period. A minor shift is estimated to relieve some of the south driveway congestion, however, Signal Warrant 3 Condition B would still be met.

### **XIII. Mitigation Recommendations**

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#### **A. Mitigation Fee Analysis**

Per City Ordinance No. 3685, road impact fees will be required. Fees must be paid prior to issuance of building or tenant improvement permit. According to the City's current Road Impact Fee schedule (Jan 1, 2013), the fee for general office is \$7.63 per gsf (GFA).

The estimated fee based on a project gross floor area of 180,000 gsf would equate to a traffic mitigation fee in the amount of \$1,373,400. It is understood that the City will allow credit against the traffic mitigation fee for improvements that may be required to be constructed by the project at the Kirkland Way/6<sup>th</sup> St S intersection.

#### **B. Frontage Improvements**

The project will construct frontage improvements on 7<sup>th</sup> Ave S including new curb, gutter, planter strip with landscaping, and sidewalk. The present site plan design includes two access points to 7<sup>th</sup> Ave S: 1) an emergency only access at the west end of the property and 2) a restricted movement general use access at the east end, at the 7<sup>th</sup> Ave S/5<sup>th</sup> Pl S junction. The recommended access design at the east end is discussed in Section XIII.C.1.

#### **C. Mitigation for SEPA Impact**

As noted above, the project will be required to pay towards the City's traffic impact fee program based on the City's current fee structure and project floor area/land use type. In addition to that, they will be required to construction frontage improvements on 7<sup>th</sup> Ave S.

The following are additional mitigation recommendations for the project for areas surrounding the 6<sup>th</sup> St S corridor:

##### **1. Project Access to 7<sup>th</sup> Ave S**

General use (employee access) is proposed to 7<sup>th</sup> Ave S at the 7<sup>th</sup> Ave S/5<sup>th</sup> Pl S junction. The Google parcel is restricted through title agreements that none of the traffic associated

with the project will use 7<sup>th</sup> Ave S, either entering or exiting. All of the properties fronting 7<sup>th</sup> Ave S are residential to the west. The recommended design for the north access is designed such that no right turns entering the site are permitted or feasible from the west, and no left turns exiting the site to the west are permitted or feasible.

As conceptual sketch with the recommended design concept for this is shown in Figure 14.

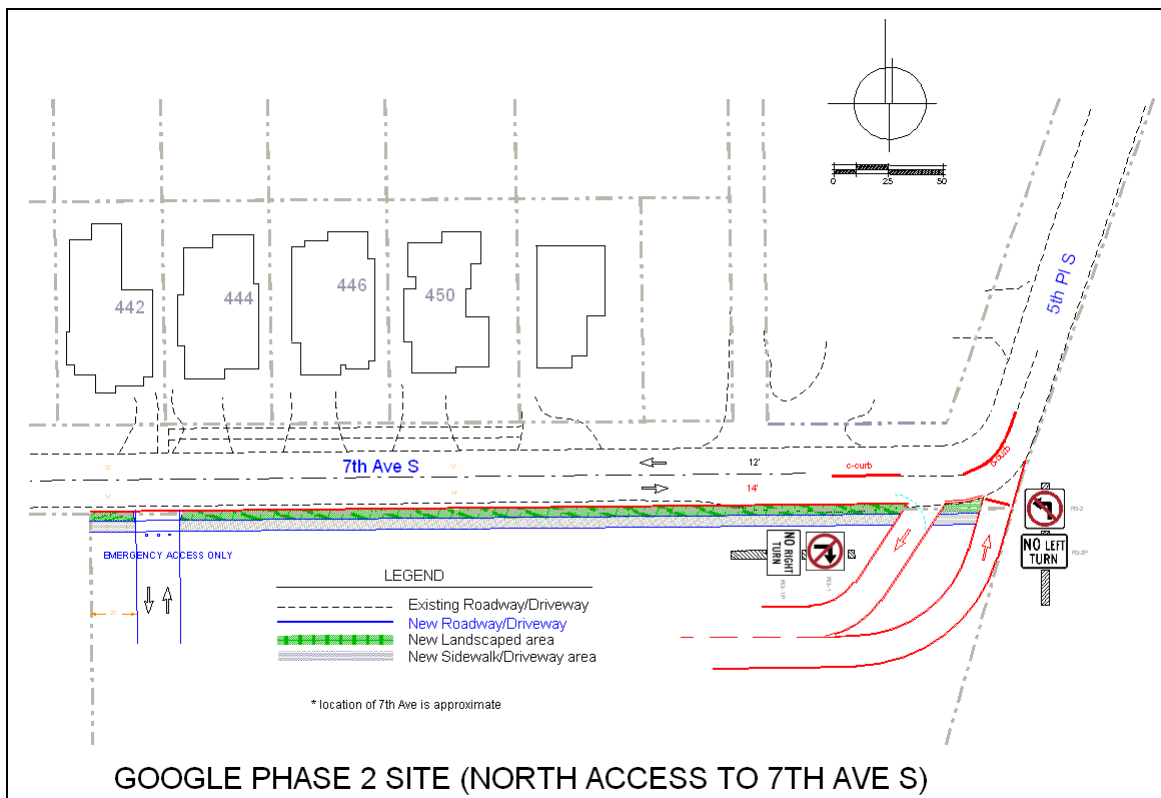


Figure 14

## 2. 6<sup>th</sup> St S between 9<sup>th</sup> Ave S and NE 68<sup>th</sup> St Rechannelization

The current channelization of this section of 6<sup>th</sup> St S includes a single lane each direction, a bike lane each direction and on-street parking both sides. At the NE 68<sup>th</sup> St/6<sup>th</sup> St S (aka 108<sup>th</sup> Ave NE) intersection, the north leg includes a 70-foot southbound left turn storage pocket, and an 80-foot opening taper.

The recommended improvement (to be mitigated by this project) would include conversion of the roadway to a 3-lane section with bike lanes both sides adjacent to the existing curbs. On-street parking would be eliminated. With elimination of on-street

parking, the sight distance will significantly improve for motorists exiting 9<sup>th</sup> Ave S, as well as visibility of pedestrians crossing 6<sup>th</sup> St S with motorists northbound on 6<sup>th</sup> St S.

The design would include 150-foot southbound left turn pocket that would transition (50' opening) into a center two –way left turn lane. The center two-way left turn lane would be 275-feet in length to the south end of the 9<sup>th</sup> Ave S cross-street intersection where it would break for the intersection. See Figures 15a and 15b. Final storage length to be determined through design process.

A crosswalk is recommended on the north leg at the 6<sup>th</sup> St S/9<sup>th</sup> Ave S intersection along with signage and flagging. It is anticipated there will not be a high volume of pedestrian crossings thus the pedestrian crosswalk signage should be consistent with the other crosswalk crossings. No rapid flashing beacons are recommended.

In addition, a crosswalk across 9<sup>th</sup> Ave S is recommended. The bus stop on the east side south of 9<sup>th</sup> Ave S should be relocated closer to the 9<sup>th</sup> Ave S intersection.

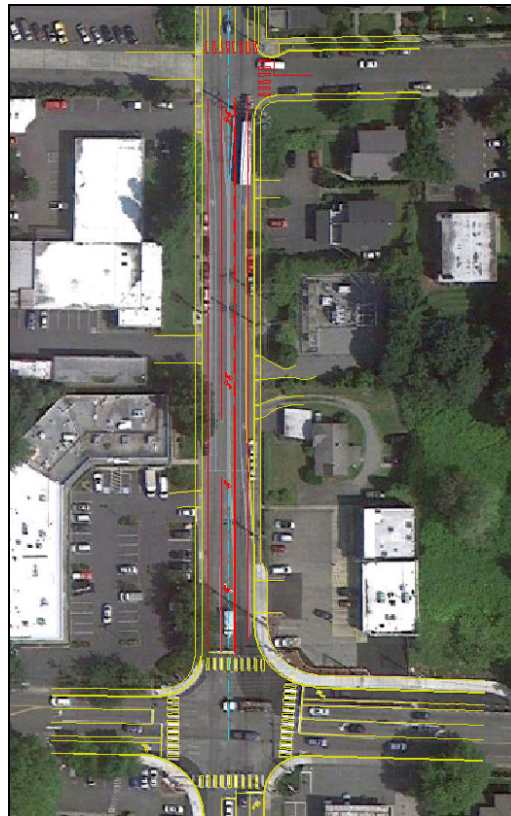
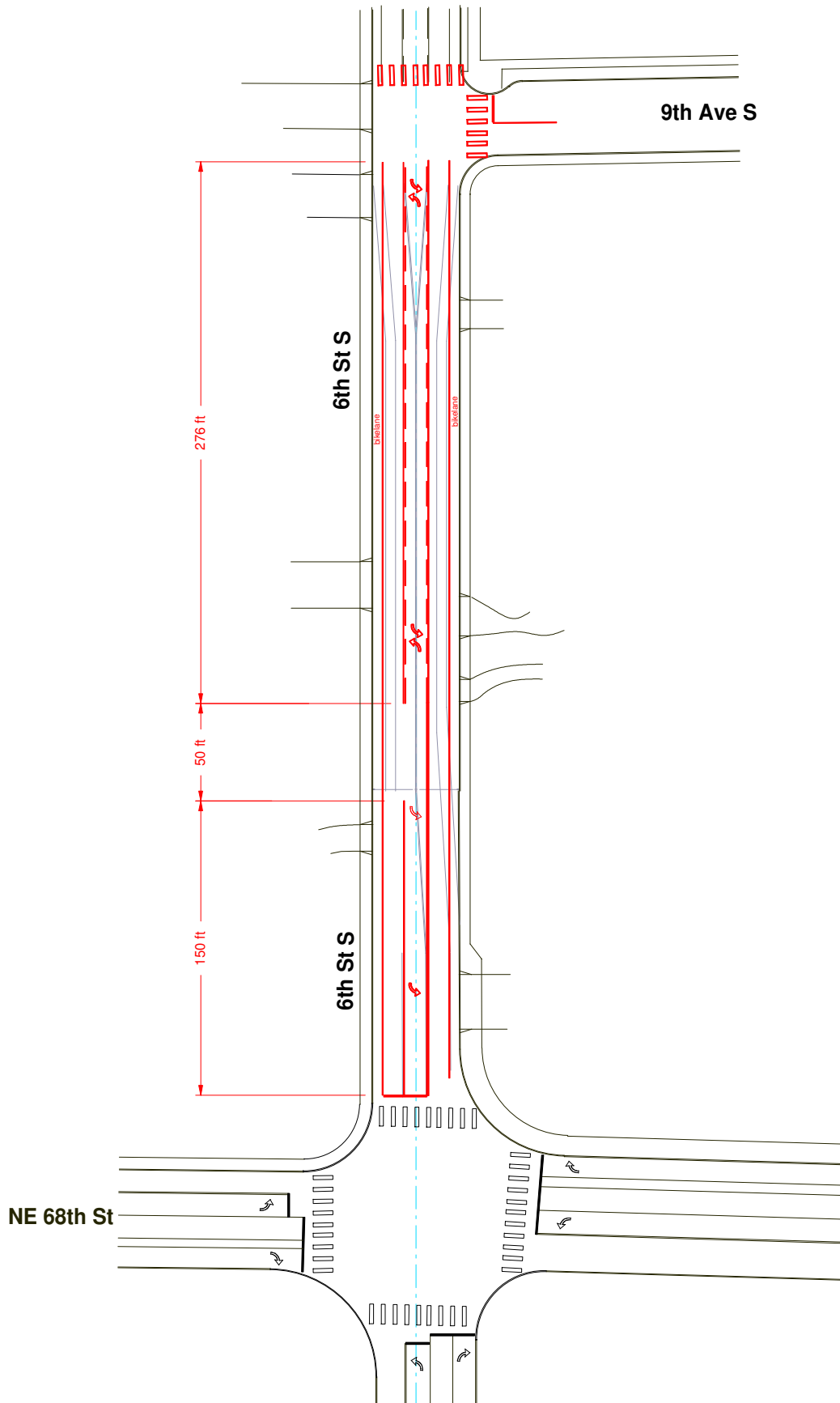


Figure 15a



### **3. New Signal at 6<sup>th</sup> St S/Kirkland Way**

Construct a new signal at the 6<sup>th</sup> St S/Kirkland Way intersection. This intersection is currently an all-way stop controlled intersection. This improvement is estimated to have several benefits including: 1) a significant improvement to the level of service for the AM and PM street peak hours, 2) safer pedestrian crossing environment with pedestrian signal phasing, 3) will lessen the queuing for the northbound approach as well as other approaches, and 4) will reduce the delay at this intersection thereby reducing the potential for cut-through traffic to Kirkland Ave and farther out to 8<sup>th</sup> St S.

6<sup>th</sup> Street/Kirkland Way is on the unfunded list for signalization. It was part of the Park Place mitigation however, if Google Phase 2 develops first, and assuming the signal is warranted, then the Google Phase 2 development will be responsible to make the improvement. This signal project was taken off the road impact fee project list when the City had to reduce their CIP project list, so mitigation fee credit (against road impact fees) would not be given. However, the road impact fee ordinance that allows the Public Works Director to give road impact fee credit for a non-road impact fee improvement project if the director finds that the improvement is now a critical road capacity improvement.

### **4. 6<sup>th</sup> St S/5<sup>th</sup> Ave S Sight Distance Improvements**

This intersection is estimated to operate at satisfactory LOS for both street peak periods in the future, assuming a signal is constructed at 6<sup>th</sup> St S/Kirkland Way. Some concern was expressed by residents regarding sight distance exiting from 5<sup>th</sup> Ave S. To improve sight distance, to be able to achieve the City's minimum criteria of 200 feet for a 30 mph mainline, it is recommended that on-street parking be restricted for a set zone (90-feet) south on 6<sup>th</sup> St S from 5<sup>th</sup> Ave S. The viewing north for 200 feet is attainable due to the fact there is a bus-stop zone just north of 5<sup>th</sup> Ave S thereby restricting parking.

Figure 16 depicts the sight lines and recommended no parking zone.

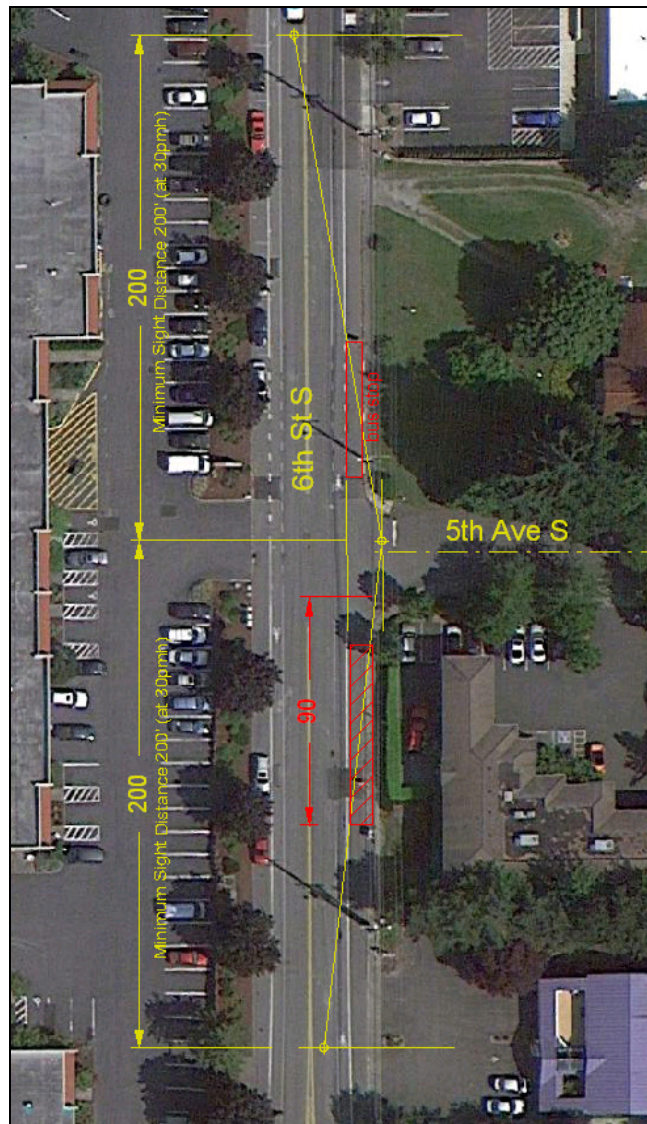


Figure 16

## 5. On-Street Parking Restrictions

Implement parking duration limitations on 5<sup>th</sup> Ave S and 9<sup>th</sup> Ave S to reduce parking demand during weekday daytime periods. If long-term parking is taxing supply on the 5<sup>th</sup> Ave S and 9<sup>th</sup> Ave S, parking signage such as 2-hr or 4-hr duration 7am thru 6pm Monday through Friday is recommended. However, contradictory to this recommendation, the parking demand is likely to lessen with the completion of the South Kirkland Park and Ride, therefore, it is recommended that the parking demand be re-evaluated once the improved park and ride facility is completed and in operation.

## **6. Transportation Demand Management (TDM)**

Implement a Transportation Management Plan to enact TDM measures to reduce single occupant vehicle employee commute. Recommended measures are identified in Section XI.

The site is well served by 3 transit routes, which should provide ample opportunity for employees to use transit.

With future construction of the Cross Kirkland Corridor Trail, the trail will provide great opportunity for Google employees to bike to and from work. The City will soon begin construction of the Interim Trail, expected to be complete in early 2014. Features of the Trail would include:

- All-weather new crushed gravel surface within the existing rail bed (rails & ties removed),
- The Trail will extend from 108<sup>th</sup> Avenue NE (south end) to 132<sup>nd</sup> Avenue NE (north end); 5.75 miles,
- Compliant with the Americans with Disabilities Act (ADA),
- Improved road crossings where needed,
- New signing and markings at street crossings,
- Railing or fencing where required for safety or to protect sensitive areas, and
- Modifications to existing railroad trestles, as required, for safe and accessible pedestrian passage.

## **7. Manage Neighborhood Cut-Through by Google Employees**

Work with adjacent neighborhoods to control cut-through traffic by Google employees. It is estimated that there will be no cut-through traffic from Google on 7<sup>th</sup> St S or 8<sup>th</sup> St S, however, it is recommended that Google discourage its employees from utilizing these routes as part of its TDM program or via an annual or semi-annual news letter program.

## **8. Kirkland Ave Traffic Calming**

There is currently a large amount of vehicles using Kirkland Ave (local access street) as a by-pass of the Kirkland Way arterial route. The recommended new signal at 6<sup>th</sup> St S/Kirkland Way is estimated to reduce some of this by-pass traffic.

In particular during the PM peak period, or simply for northbound to eastbound travel towards the NE 85<sup>th</sup> St/I-405 interchange, use of Kirkland Ave is a natural by-pass route of Kirkland Way. Traffic calming devices such as 2 speed humps on this section is recommended to reduce the by-pass activity and reduce speeds. These measures are not

anticipated to eliminate all by-pass traffic though. Additional features such as curb-bulbs at the endpoint intersections are also estimated to reduce by-pass traffic and lower speeds at the end points for vehicles turning onto Kirkland Ave.

It is recommended that if any of these traffic-calming measures are implemented, that the costs of improvements be shared between the City and the developer due to the fact this is an existing natural by-pass opportunity for many of the existing motorists.

## **9. Emergency Vehicle Access**

Provide an emergency vehicle only access to the site from 7<sup>th</sup> Ave S near the west end of the property. Paint all curbs on the internal access road “red” to signify no parking.